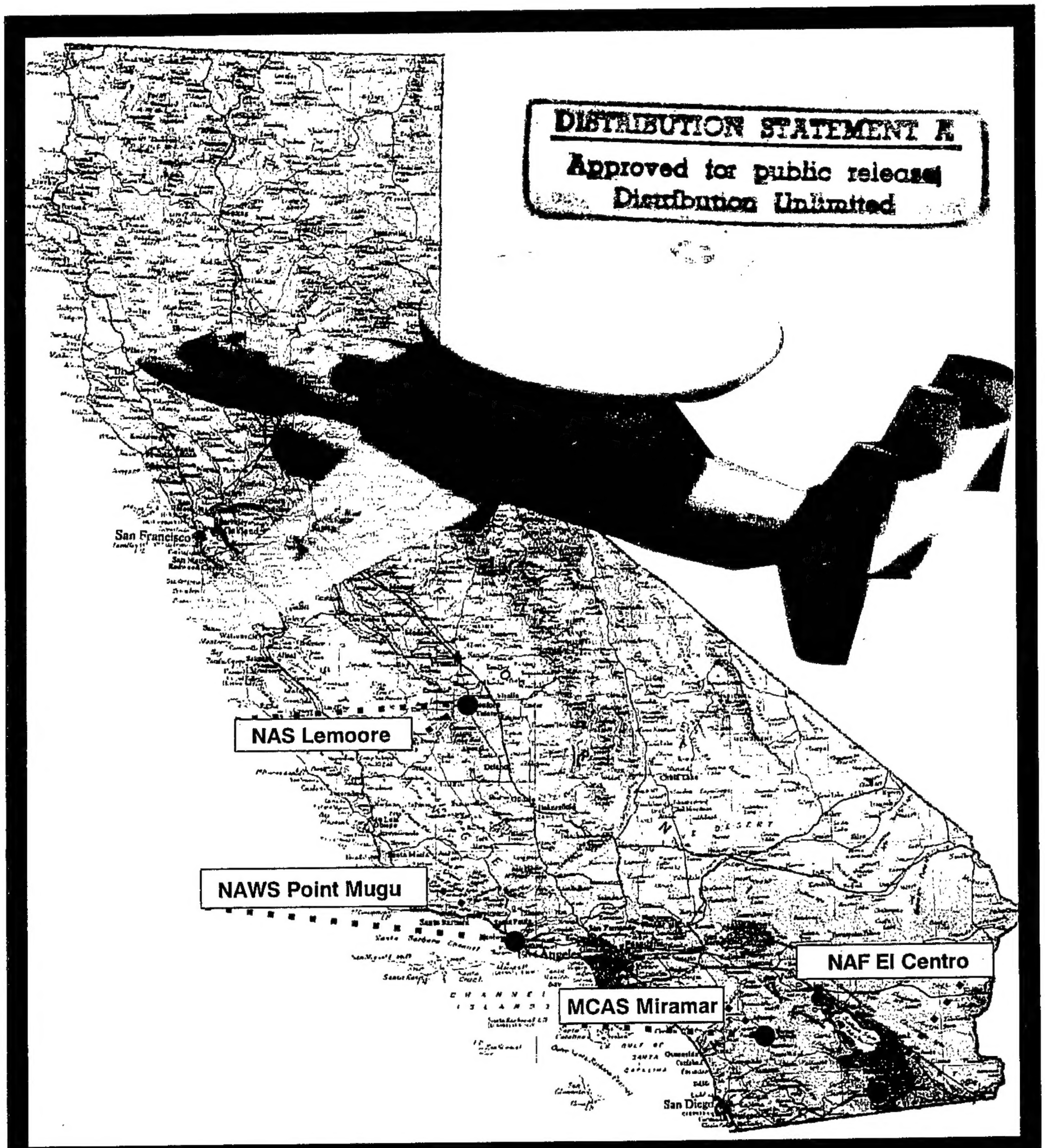
Final Environmental Impact Statement for the Realignment of E-2 Squadrons from Marine Corps Air Station (MCAS) Miramar

Technical Appendices

Volume II



US Department of Defense
Department of the Navy

March 1998

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
Ser 553.KK/135
April 13, 1998

Dear Librarian:

We request that the enclosed Final Environmental Impact Statement (FEIS) for the Realignment of E-2 Squadrons from Marine Corps Air Station (MCAS) Miramar be made available for public review through May 18, 1998. Please retain this document in your reference section. The Notice of Availability will appear in the Federal Register on April 17, 1998.

If you have any questions or require additional information, please contact the undersigned at (619)532-2456. All public comments must be provided to Ms. Knight in writing by May 18, 1998.

Sincerely,

Kelly K Knight

KELLY K. KNIGHT
Environmental Planner
By direction of the Commander

Distribution:
(see attached list)

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National City, CA 91950

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Ventura, CA 93003

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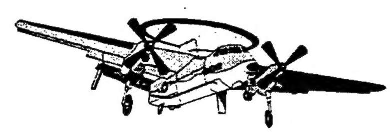


Appendix A. Public Involvement

APPENDIX A
PUBLIC INVOLVEMENT

As discussed in Section 1.5, Public Involvement Process of this document, the NEPA process is designed to involve the public in the decision-making process. This appendix contains copies of the public involvement materials used to inform federal, state, and local agencies, elected officials, organizations, and individuals about the preparation of this document.

A scoping letter and project summary was distributed to announce the Navy's intent to prepare this environmental impact statement (EIS), the start of the public scoping period, the dates and locations of the public scoping meetings, and the address and deadline to provide scoping comments (Section A.2). A notice of intent (NOI) was published in the Federal Register on May 1, 1996 (Volume 61, Number 85). A copy of the NOI is provided in Section A.3. The NOI was published in nine local newspapers— Hanford Sentinel, Lemoore Advance, Fresno Bee, Imperial Valley Press, San Diego Union Tribune, Eagle (Coronado), Coronado Journal, Ventura County Star, and the Los Angeles Times, Ventura County Edition.

A notice of availability (NOA) for the draft EIS (DEIS) was published in the Federal Register on November 21, 1997 (Volume 62, Number 225). A copy of the NOA is provided in Section A.4. The NOA was published in seven local newspapers— Hanford Sentinel, Lemoore Advance, Fresno Bee, Imperial Valley Press, San Diego Union Tribune, Ventura County Star, and the Los Angeles Times, Ventura County Edition. Sample newspaper advertisements and the dates of publication are provided in Section A.5.

A.1 SUMMARY OF SCOPING COMMENTS

Written and verbal comments received during the EIS scoping process, which ended on June 6, 1996, are summarized below for the three proposed alternative sites. Verbal comments were received during four scoping meetings held in the City of Oxnard on May 21, 1996, the City of El Centro on May 23, 1996, the City of Coronado on May 28, 1996, and the City of Lemoore on May 29, 1996.

A.1.1 Preferred Alternative: NAWS Point Mugu (City of Oxnard)

Specific environmental issues or concerns related to the EIS and the sections in which they are addressed are summarized in Table A-1.

Table A-1
Summary of Scoping Comments for NAWS Point Mugu

Comment	Addressed in Section(s)
Comments requested that the EIS address the compatibility of the proposed action with the California Coastal Zone and with the Joint Use Proposal of the Federal Aviation Administration to turn Point Mugu into a commercial airport.	*Section 4.3, Land Use and Airspace*
Comments requested that the EIS consider the effects on private sector investment in the area, including the effects on the local employment base and job opportunities. Concerns were expressed that spouses of proposed action employees and Navy personnel would take jobs that would otherwise go to local residents. Additional statements, pro and con, gave opinions on the net effect of the proposed action on the local economy. Concern was voiced about the noise effects on sports fishing and boating off the coast in the Point Mugu vicinity.	*Sections 4.4, Socioeconomics and 4.7, Noise*
Comments requested that the effect on the county transportation system and roadway network be addressed.	*Section 4.5, Traffic and Circulation*
Comments requested that the air analysis be conducted in a manner that is consistent with the local air district guidelines. It should assess its consistency with the Ventura County Air District's Air Quality Management Plan. A letter from the air district stated that the proposed action would not have a significant district air quality impact.	*Section 4.6, Air Quality*
Comments requested that the noise effects be addressed in the EIS on the Channel Islands Marine Sanctuary, the Channel Islands National Park, Ormand Beach Wildlife Area, and on sports fishing and boating off the coast in the Point Mugu vicinity. Request for noise level information on individual aircraft, not just averaged noise levels. Request for noise analysis that accounts for measured noise levels, flight frequencies, and lowest flight elevations at maximum speeds.	*Sections 4.1, Biological Resources and 4.7, Noise*
Concern was expressed over the effects on people living and working in the flight zones. Information was requested about bird aircraft strike hazard (BASH) avoidance techniques. Comments requested evaluation of the compatibility of the proposed action at Point Mugu with private aircraft in the area. Concerns were raised about the potential public health effects of radiation associated with the proposed action.	*Sections 4.3, Land Use and Airspace and 4.11, Public Health and Safety*
Comments requested consideration of any possible expansion of the E-2 squadron over proposed action levels in the future. Information was requested about the possible linking of squadron activity with other installations or use of joint aircraft operations for testing and other purposes (Navy Project Blue Air Strategy). The proposed action's relationship to granting of the Port Hueneme Hi/Low MOA was questioned.	*Section 5, Cumulative Effects*

A.1.2 NAS Lemoore Alternative (City of Lemoore)

Specific environmental issues or concerns related to the EIS and the sections in which they are addressed are summarized in Table A-2.

Table A-2
Summary of Scoping Comments for NAS Lemoore

Comment	Addressed in Section(s)
It was requested that the EIS address any traffic impacts to county roadways.	*Section 4.5, Traffic and Circulation*
The Westlands Water District representative commented that the district might not always be able to deliver the 3,000 acre-feet of water currently contracted for between the Navy and Westlands.	*Section 4.9, Utilities and Services*
Some of the comment letters expressed support for or opposition to the proposed action at NAS Lemoore based on the availability or unavailability of housing and other community services at the base or in the community.	*Section 4.4, Socioeconomics*

A.1.3 NAF El Centro Alternative (City of El Centro)

Specific environmental issues or concerns related to the EIS and the sections in which they are addressed are summarized in Table A-3.

Table A-3
Summary of Scoping Comments for NAF El Centro

Comment	Addressed in Section(s)
A comment letter from the Imperial County Planning Department expressed concern and support for the proposed realignment of E-2 squadrons to NAF El Centro. Concerns are summarized below. – Comply with adopted land use controls to protect NAF El Centro from incompatible uses, to guard public safety, and to encourage the compatible use of NAF El Centro with agriculture and open space.	Sections 4.3, Land Use and Airspace and 4.11, Public Health and Safety
– The E-2 realignment to NAF El Centro should be consistent with the County General Plan (1993) land use element in which factors that may accelerate growth and economic development are addressed.	Sections 4.3, Land Use and Airspace and 4.4, Socioeconomics
– The E-2 realignment to NAF El Centro should be consistent with the 1990 Air Installation Compatible Use Zones (AICUZ) study, which is currently being revised that includes potential air safety, noise and impact analyses for continuing the growth in annual operation levels.	Sections 4.3, Land Use and Airspace, 4.7, Noise, 4.11, and Public Heath and Safety
– Noise impacts of its relocated operations on adjoining urban populations that are contiguous to any and all of the proposed new sites.	Section 4.7, Noise
– Crash and safety hazards to adjoining urbanized and densely populated centers.	Sections 4.3, Land Use and Airspace and 4.11, Public Health and Safety
– Lighting impacts on training operations as a result of urban development, which may preclude true night, field carrier landing practice (FCLP) exercises.	Impacts of the community on the proposed action were not evaluated. Impacts of the proposed action on the community were evaluated. Selection of alternative sites considered the needs of the E-2 mission.

Table A-3
Summary of Scoping Comments for NAF El Centro *(continued)*

Comment	Addressed in Section(s)
– Availability, including costs of acquiring additional land or buffer areas, around the new site for long-term viability and future expansion capacity.	This type of analysis is not typically within the scope of environmental review.
– Restrictions on operating hours due to noise controls, or local noise regulations.	4.7, Noise
– Topographic and weather related factors that would impact operating, training and safety.	These factors were part of the selection process for alternative sites and are not analyzed in the EIS.
– Location of the selected facility by comparing urban restrictions imposed on the operations of the Navy versus open space non urban areas with consideration to the proximity of the San Diego based fleet (i.e., flight time between San Diego based operations and other proposed locations).	These factors were part of the selection process for alternative sites and are not analyzed in the EIS.
– Long-term viability of the new site with regard to topography, climate, open space, local land use support, public support or opposition, public safety, expansion and cost.	These factors were part of the selection process for alternative sites and are not analyzed in the EIS. Public safety is addressed in 4.11, Public Health and Safety, land use issues are addressed in 4.3, Land Use and Airspace
– Relationship of new base site to air-to-ground target ranges, and air-to-air combat training ranges.	These factors were part of the selection process for alternative sites and are not analyzed in the EIS.
– Local as well as political, business, and adjacent community support or opposition.	The scope of the environmental analysis does not include addressing support or opposition for the proposed project; however, specific community environmental concerns are addressed.
– Conflicts, if any, with local airports in the vicinity of any of the proposed sites.	Section 4.3, Land Use and Airspace
– Air quality impacts of the E-2 squadrons on local air standards, and local air quality conditions that may impact (including visibility) the training of E-2 squadron aircrew.	Air quality concerns are addressed in 4.6, Air Quality. Factors such as visibility for the E-2 aircrews was part of the alternative site selection process and is not addressed in the EIS.

A.1.4 NAS North Island (City of Coronado)

NAS North Island was eliminated from detailed consideration in the EIS and consequently, comments received during scoping were not addressed in the document. Table A-4 summarizes the comments received for NAS North Island during the public scoping period.

Table A-4
Summary of Scoping Comments for NAS North Island

Comment
Comments requested that certain information about the proposed action in the fact sheet (prepared for the scoping meetings) be augmented. Specifically it should include the basis for concluding that E-2C flight operations would require eight additional flights per day and identify the total flights per day that would be required. Similarly, the fact sheet specifies that 8,000 practice carrier landings per year would be required, and the EIS should identify the total number of landings required, where these landings would occur, and if the addition of the proposed action would affect the landing requirements of existing aircraft at NAS North Island. Exact E-2 flight paths should be identified, including any changes to existing aircraft flight paths required. Descriptions of the E-2 aircraft, including wingspan, gross weight, type and size of engines, radar power level, wavelength, radar signal strength and distance, and radar power source are requested. Also requested is information about the electromagnetic field generated, including field strength, size, direction, and whether the fields intersect any land areas during flight, takeoffs, or landings. Finally, descriptions are requested for planned flight operations, including the number of monthly training flight operations and scheduled flights.
The effects of radar waves or resulting electromagnetic fields on wildlife should be analyzed. Will the radar have an adverse effect on the number or diversity of unique, rare, endangered, sensitive, or protected plants and animals? Would it have an adverse affect on their migratory or mating patterns? Would there be an adverse effect on the National Wildlife Refuge and Waterbird Management Area in South San Diego Bay?
The EIS should address the proximity of Lindberg Field to NAS North Island.
Comments requested that the EIS consider the effects on property values on Coronado and the potential reduction in quality of life from increases in traffic associated with the proposed action. Concerns were expressed about potential adverse effects on tourism on the island. One requests a presentation of the cost differences for E-2 relocation to NAS North Island versus the other three alternative sites. What would be the impacts on population, housing, building construction, runway construction, expansion or modification. Comments requested that the EIS address the total traffic impacts (quantity of vehicles, noise, vehicle emissions, and highway/street maintenance costs to Coronado citizens. Specific attention should be given to the following locations and issues: – Traffic on Ocean, Fourth, Second, and First streets at peak morning, afternoon, and evening hours – Cumulative traffic impact from squadrons, commands, units facilities, laboratories, schools, depots and ships planned or anticipated to take permanent residence, become a tenant or be homeported at NAS North Island during the next ten years – Impact to traffic flow with a Third Street entrance – Impact to traffic flow with a Third Street entrance, a Fourth Street exit and no regular entry/exit at either Second and/or First streets – Truck traffic supporting facilities modernization, equipment movement, hazardous waste movement and new construction – Total number and percentage of air station and tenant command personnel that will use alternative transportation measures – Impacts to Coronado street parking availability – Impacts to Coronado pedestrians, in particular to school children and seniors during peak traffic hours – Existing truck and other vehicular trips compared to projected trips – A justification provided for the base years used in the traffic analysis, with latest available information recommended – Exact dates for daily traffic volumes should be used

Table A-4
Summary of Scoping Comments for NAS North Island *(continued)*

Comment
– All supporting data for traffic should be included for public review – Requested use of a worst case scenario, rather than an "average" scenario, for traffic analysis – Key intersections should be analyzed for effects Specific focus on the traffic effects on Coronado, rather than or in addition to effects on a broader area
Comments requested that the air analysis be conducted in a manner that is consistent with the local air district guidelines. All supporting data for air quality analysis should be included for public review. A justification provided for the base years used in the air quality analysis, with latest available information recommended. Specific focus on the air quality effects on Coronado, rather than or in addition to effects on a broader area. Any emission offsets required for this proposed action should be identified. Particulate air pollution (to PM 2.5) from the operations and fuel burning of the planes, diesel trucks, and other vehicles should be examined. Dust and carbon pollution should also be analyzed. Concern was expressed about the continuous loading of air toxics in the air basin. Cumulative impacts should include emissions from Site 9 and 11 remediation.
Comments requested that noise contours should be prepared showing the existing noise "footprint," the future noise footprint, and an E-2 only noise footprint, at each alternative site. Also, any noise effects from E-2 aircraft ground operations and maintenance. Concerns were raised about the noise effects on residential and commercial areas within the flight zones. All supporting data for noise should be included for public review. A justification should be provided for the base years used in the noise analysis, with latest available information recommended. Specific focus on the noise effects on Coronado, rather than or in addition to effects on a broader area. Will noise sensors or monitors be installed and observed to detect excessive air traffic noise levels?
Comments request an explanation in the EIS of how impacts to health and safety will be measured. Concern was expressed about the existing risk to residents from Navy aircraft overflights, and the increase in risk that would occur with the proposed action. The EIS should include a full listing of naval air accidents and make available the results of E-2 inspection and operations reports so that the public can assess the risks of a crash from one of these airplanes. All potential cargoes of planes should be revealed and their risks to residents in Coronado assessed. Types of weapons for training and deployment should be discussed. The effects of radar waves or resulting electromagnetic fields on humans should be analyzed. Will the strengths of radar radiation waves and electromagnetic fields be measured and monitored in homes, schools, and beaches? Would additional aircraft fuel storage tanks be required? Potential risks from additional fuel storage and increased likelihood of fuel spills should be analyzed. The anticipated health impacts to residents of communities living downwind of the proposed action should be analyzed.
All waste stream types and quantities should be discussed, as well as disposal sites. Comment requests discussion on how increasing hazardous waste generation at NAS North Island will meet the stated Naval goal of 50 percent reduction of hazardous waste generation at federal facilities in the next few years. There have been occasions that fuel has been dumped by NAS North Island airplanes, and children at a Coronado school were contaminated in a recent incident. Coronado residents complain of a film of jet fuel on their cars and lawn furniture. A full discussion is requested of the frequency and reasons for fuel dumping and the health effects of contact with JP-5 and other fuels used by the planes at NAS North Island. Comment requests that the Navy show as part of this EIS how it will institute pollution prevention in aircraft repair and maintenance.
Comment requests that the Navy reveal its "build-out" plans for NAS North Island so that the cumulative impacts can be anticipated. Comment requests that all future operations loading for the base be identified, including other ships, other cleanups that would result in significant emissions such as Sites 9 and 11, and the Navy's plans for future weapons storage, conventional and nuclear.

A.2 Scoping Letter/Notice of Intent

Notice of Intent to Prepare An Environmental Impact Statement For The Realignment of E-2 Aircraft Squadrons from Naval Air Station, Miramar

Pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), the Department of the Navy announces its intent to prepare an Environmental Impact Statement (EIS) to evaluate the environmental effects of realigning the Airborne Early Warning Wing (AEWWING) consisting of four E-2 aircraft squadrons and associated personnel presently located at Naval Air Station (NAS) Miramar to other air stations with compatible missions and functions.

The realignment is in accordance with the legislative requirements of the Defense Base Closure and Realignment Act (DBCRA) of 1990 (Public Law 101-510), as implemented by the Base Realignment and Closure (BRAC) processes of 1993 and 1995. BRAC 1993 and 1995 directed the closure of Marine Corps Air Stations (MCAS) El Toro and Tustin and realigned aviation units, functions and personnel at MCASs El Toro and Tustin to NAS Miramar and MCAS Camp Pendleton. The Navy and Marine Corps agreed to transfer ownership of NAS Miramar from Navy to Marine Corps in September 1997. Accordingly, the four AEWWING squadrons must be relocated from their present location at NAS Miramar.

The proposed action entails relocating four E-2 squadrons (16 aircraft), as well as related support personnel, equipment, and functions from NAS Miramar to other naval air stations. Using operational requirements delineated by the Commander AEWWING, the Navy has identified NAS North Island, NAS Lemoore, Naval Air Warfare Center (NAWC) Point Mugu and Naval Air Facility (NAF) El Centro as potential receiving sites for the relocated squadrons. To accommodate the AEWWING relocation, military construction projects (new construction, expansion, modification or demolition) would be necessary at any receiving site under consideration. The amount of new construction is dependent on availability and compatibility of existing space at each alternative base. In all cases, new or modified hangar space, aircraft parking aprons, maintenance facilities and E-2 specific training facilities would be required. Construction or modification of community support facilities would be based on the adequacy and capacity of existing resources at each base.

The Navy intends to analyze the environmental effects of the realignment and potential construction at the four alternative base locations. Major environmental issues that will be addressed in the EIS include, but are not limited to: geology/soils/seismicity; biology; water resources/hydrology/drainage/flood control; noise; air quality conformity; land use; cultural resources; socio-economics; transportation/circulation; public health and safety/hazardous materials; aesthetics; public services/utilities; and environmental justice.

A.2 SCOPING LETTER/NOTICE OF INTENT *(continued)*

The Navy will initiate a scoping process for the purpose of determining the extent of issues to be addressed and identifying the significant issues related to the AEWWING realignment. The public and interested parties will be invited to participate in the scoping process, to review the draft EIS and to attend a public meeting on the draft EIS. Public scoping meetings will be conducted at 7:00 p.m. near all four alternative base locations on the following dates:

- Tuesday May 21, 1996 at
  Oxnard Center for Performing Arts, Thousand Oaks/Hueneme Room, 800 Hobson Way, Oxnard, California.

- Thursday, May 23, 1996 at
  Imperial County Administration Center, Board of Supervisors Chambers, 940 W. Main Street, El Centro, California.

- Tuesday, May 28, 1996 at
  Coronado High School Auditorium, 650 D Avenue, Coronado, California.

- Wednesday, May 29, 1996 at
  Lemoore Union High School, Cafeteria Back Room, 101 East Bush Street, Lemoore, California.

A brief presentation on the proposed action will precede the request for public comment. Navy representatives will be available at these meetings to receive comments from the public regarding issues of concern. It is important that federal, state, local agencies and interested individuals take this opportunity to identify environmental concerns that should be addressed during the preparation of the draft EIS.

Agencies and the public are invited and encouraged to provide written comments in addition to, or in lieu of, oral comments at the public scoping meetings. To be most helpful, scoping comments should clearly describe specific issues or topics which the commentor believes the draft EIS should address. Written statements or questions regarding the scoping process should be postmarked no later than June 6, 1996, to Commanding Officer, Southwest Division, Naval Facilities Engineering Command, 1220 Pacific Coast Highway, San Diego, CA 92132-5187 (Attention: Ms. Kelly Knight, Code KK.232). Ms. Knight may be reached by phone at (619) 532-1158 or by fax at (619) 532-3824.

A.2 SCOPING LETTER/NOTICE OF INTENT *(continued)*

SCOPING MEETING

FOR THE DEPARTMENT OF THE NAVY'S

DRAFT ENVIRONMENTAL IMPACT STATEMENT
FOR THE REALIGNMENT OF E-2 AIRCRAFT SQUADRONS
FROM NAVAL AIR STATION MIRAMAR

AGENDA

1. SPEAKER AND TOPICS

Captain Tad Chamberlain Commander, Naval Air Force U.S. Pacific Fleet	Introductions Meeting Procedures Purpose and Need Description of Proposed Action Facility Requirements Alternatives Under Consideration EIS Issues

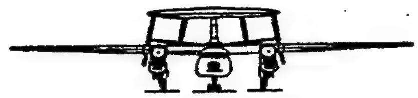
2. PUBLIC COMMENTS
The principal purpose of this meeting is for the Navy to receive public and agency comments on the content of the Draft EIS. The majority of the time will be devoted to this purpose. Directions on the procedures for participating in this meeting are provided below.

Instructions for Participating in the Scoping Meeting:

Thank you for attending this scoping meeting. We welcome your comments and input on the Draft EIS. If you wish to speak tonight, please fill out the Speaker's Request Form and give it to one of the EIS project team members. The proceedings of this meeting are being recorded by a stenographer. Please clearly state you name, organization (if applicable), and address prior to speaking. To ensure that everyone has an opportunity to comment, we ask that you limit your spoken comments to no more than five (5) minutes. Written comments may be left in the comment box at the conclusion of this meeting or they may be mailed/faxed to: Commander, Southwest Division, Naval Facilities Engineering Command, Code 232.KK, 1220 Pacific Highway, San Diego, CA 92132-5190 [Fax #: (619) 532-3824]. Comments must be postmarked by June 6, 1996 to become part of the official record.

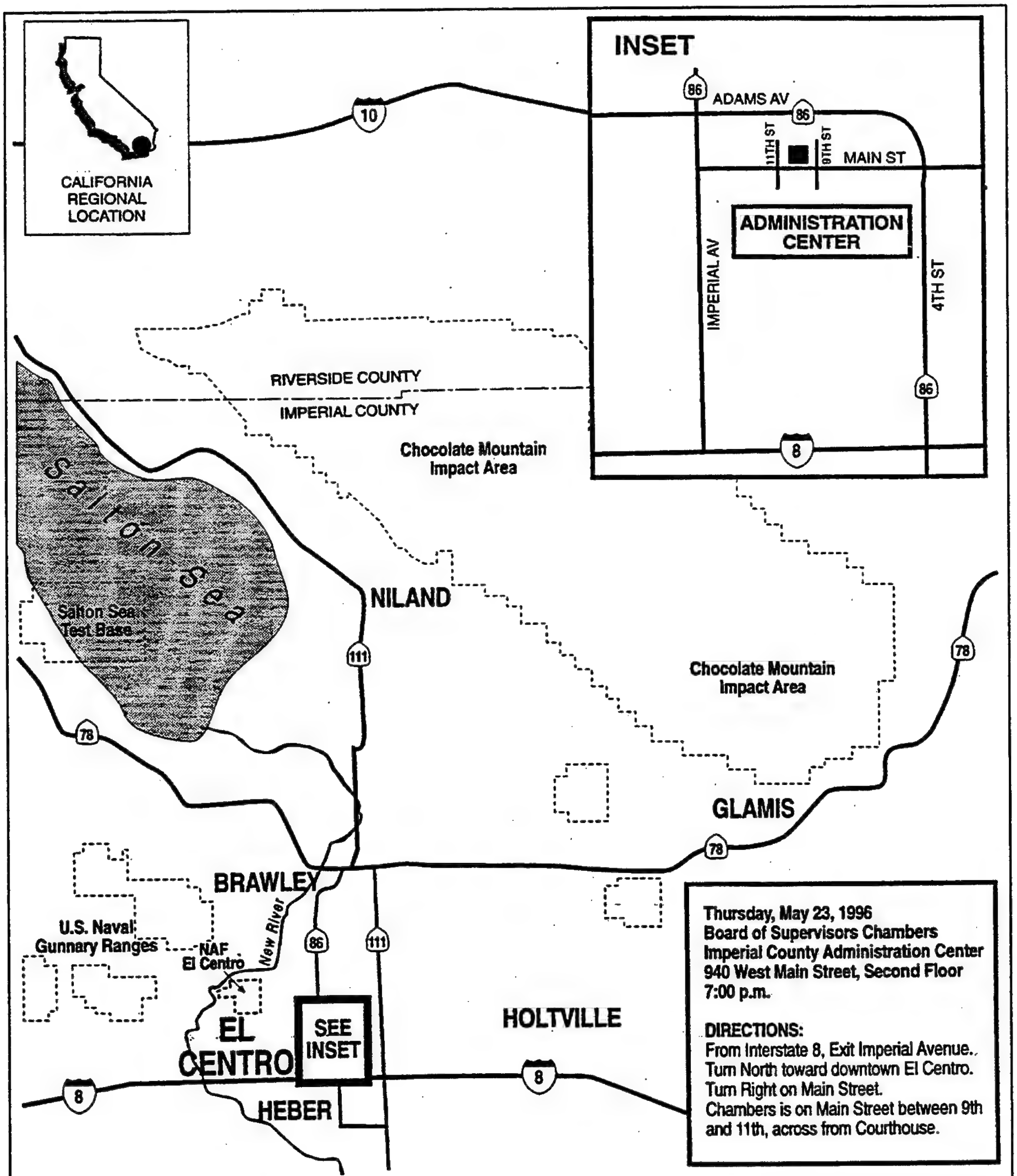
A.2 SCOPING LETTER/NOTICE OF INTENT *(continued)*

E-2 AIRCRAFT REALIGNMENT FACT SHEET



- **Currently based at Naval Air Station Miramar in San Diego**
- **Size of the project:**
  - 16 E-2C "Hawkeye" aircraft
  - 990 military personnel
  - 1,500 spouses and children
- **Main components of the project:**
  - Airborne Early Warning Wing, Pacific Staff
  - 4 squadrons (4 aircraft and 160 personnel each)
- **Average of 1.5 squadrons deployed continually**
- **Normal work schedule:**
  - Monday through Friday
  - Two shifts (7:00 AM to midnight)
- **E-2C flight operations:**
  - 8 additional flights per day
  - 8,000 practice carrier landings per year
- **Facility requirements:**
  - Hangar
  - Aircraft parking area
  - Maintenance shops
  - Supply area
  - Flight trainers
  - Classroom space
  - Staff offices
- **Proposed timing:**
  - Public Review Draft EIS — Fall 1996
  - Record of Decision — Summer 1997
  - Commence realignment — September 1997

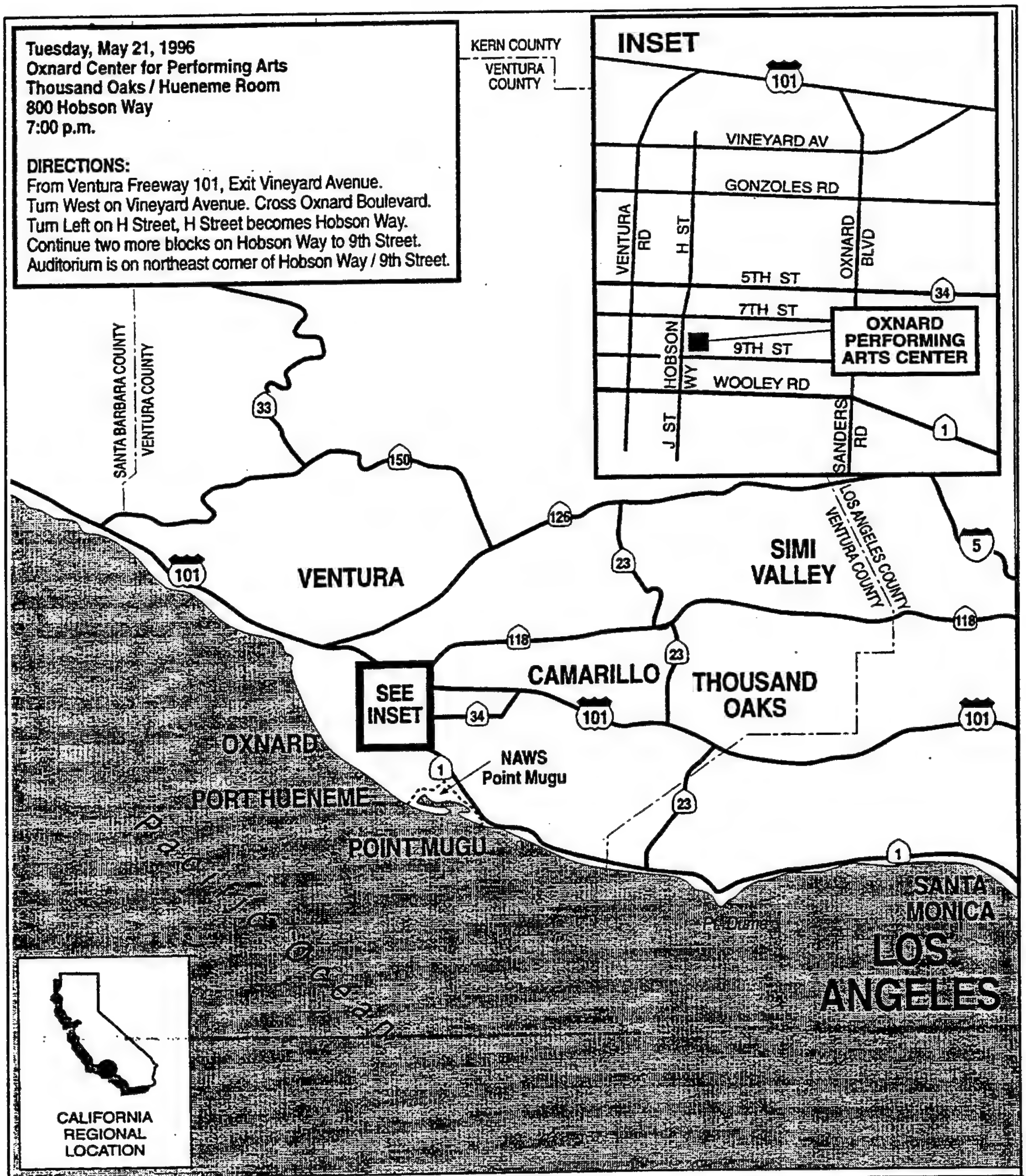
A.2 SCOPING LETTER/NOTICE OF INTENT *(continued)*



Location Map

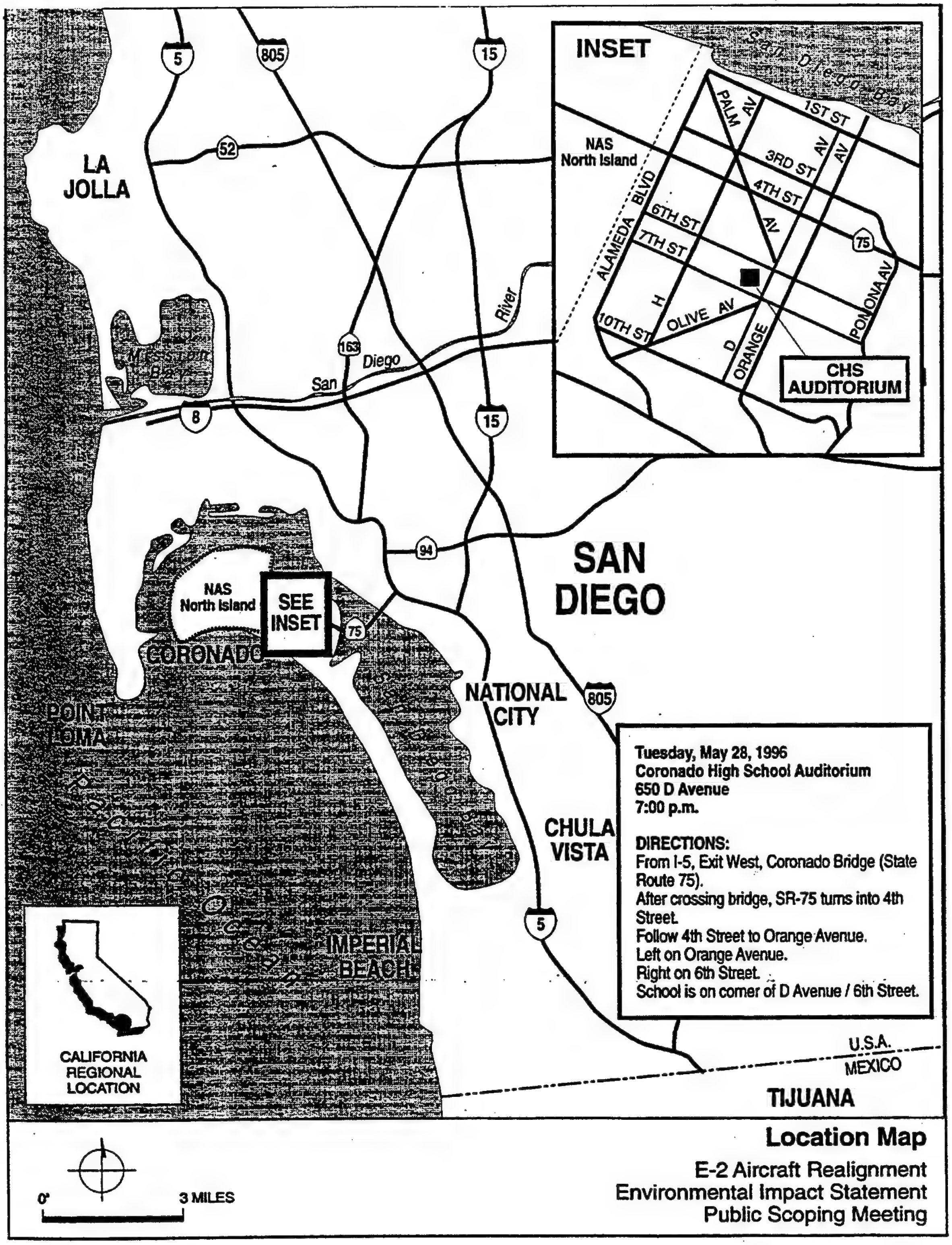
E-2 Aircraft Realignment
Environmental Impact Statement
Public Scoping Meeting

A.2 Scoping Letter/Notice of Intent *(continued)*

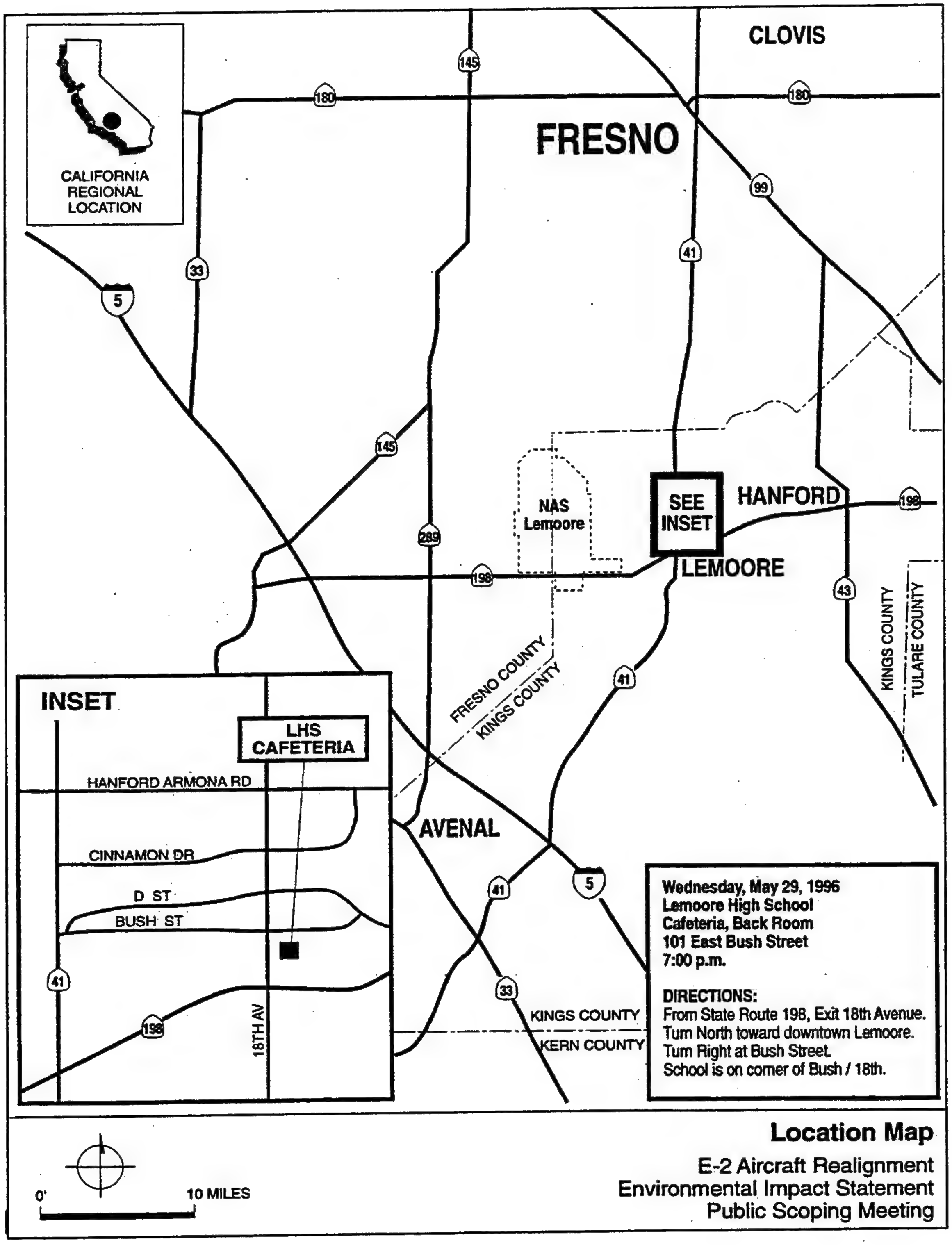


Location Map
E-2 Aircraft Realignment
Environmental Impact Statement
Public Scoping Meeting

A.2 Scoping Letter/Notice of Intent *(continued)*



A.2 Scoping Letter/Notice of Intent *(continued)*



A.3 FEDERAL REGISTER NOTICE OF INTENT

FEDERAL REGISTER NOTICE

Federal Register: May 1, 1996 (Volume 61, Number 85) [Page 19262-19263]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]

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DEPARTMENT OF DEFENSE Department of the Navy Notice of Intent To Prepare an Environmental Impact Statement for the Realignment of E-2 Aircraft Squadrons From Naval Air Station, Miramar

SUMMARY: Pursuant to Section 102(2)(c) of the National Environmental Policy [[Page 19263]] Act of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), the Department of the Navy announces its intent to prepare an Environmental Impact Statement (EIS) to evaluate the environmental effects of realigning the Airborne Early Warning Wing (AEWWING), consisting of four E-2 aircraft squadrons and associated personnel, presently located at Naval Air Station (NAS) Miramar to another naval air station with compatible mission and function.

The realignment is in accordance with the legislative requirements of the Defense Base Closure and Realignment Act (DBCRA) of 1990 (Public Law 101-510), as implemented by the Base Realignment and Closure (BRAC) processes of 1993 and 1995. BRAC-1993 directed the closure of Marine Corps Air Stations (MCAS) EL Toro and Tustin and realigned aviation units, functions and personnel at MCAS El Toro and MCAS Tustin to NAS Miramar and MCAS Camp Pendleton. The Navy and Marine Corps agreed to transfer ownership of NAS Miramar from Navy to Marine Corps in September 1997. Accordingly, the four AEWWING squadrons must be relocated from their present location at NAS Miramar. The proposed action entails relocating four E-2 squadrons (16 aircraft), as well as related support personnel, equipment, and functions from NAS Miramar to another naval air station. The Navy has identified NAS North Island, NAS Lemoore, Naval Air Warfare Center (NAWC) Point Mugu and Naval Air Facility (NAF) El Centro as potential receiving sites for the relocated squadrons. To accommodate the AEWWING relocation, military construction projects (new construction, expansion, modification or demolition) would be necessary at any receiving site under consideration. The amount of construction required is dependent upon availability and compatibility of existing space at each alternative base. In all cases, new or modified hangar space, aircraft parking aprons, maintenance facilities and E-2 specific training facilities would be required. Construction or modification of community support facilities would be based on the adequacy and capacity of existing resources at each base.

The Navy intends to analyze the environmental effects of the realignment and potential construction at the four alternative base locations. Major environmental issues that will be addressed in the EIS include, but are not limited to: geology/soils/seismicity; biology; water resources/hydrology/drainage/flood control; noise; air quality/ conformity; land use; cultural resources; socioeconomics; transportation/circulation; public health and safety/hazardous materials; aesthetics; public services/utilities; and environmental justice.

The Navy will initiate a scoping process for the purpose of determining the extent of issues to be addressed and identifying the significant issues related to the AEWWING realignment. The public and interested parties are invited to participate in the scoping process, to review the draft EIS, and to attend a public meeting on the draft EIS. Public scoping meetings will be conducted at all four alternative base locations on the following dates starting at 7:00 p.m.:

- Tuesday, May 21, 1996 at the Oxnard Center for Performing Arts, Thousand Oaks/Hueneme Room, 800 Hobson Way, Oxnard, California.

A.2 FEDERAL REGISTER NOTICE OF INTENT *(continued)*

- Thursday, May 23, 1996 at the Board of Supervisors Chambers, County Administration Center (Second Floor), 940 West Main Street, EL Centro, California.
- Tuesday, May 28, 1996 at Coronado High School Auditorium, 650 D Avenue, Coronado, California.
- Wednesday, May 29, 1996 at Lemoore Union High School Cafeteria, Back Room, 101 East Bush Street, Lemoore, California.

A brief presentation on the proposed action will precede the request for public comment. Navy representatives will be available at these meetings to receive comments from the public regarding issues of concern. It is important that federal, state, local agencies and interested individuals take this opportunity to identify environmental concerns that should be addressed during the preparation of the draft EIS.

Agencies and the public are invited and encouraged to provide written comments in addition to, or in lieu of, oral comments at the public scoping meetings. To be most helpful, scoping comments should clearly describe specific issues or topics which the commenter believes the draft EIS should address. In the interest of time, speakers will be asked to limit comments to five minutes.

ADDRESSES: Written statements or questions regarding the scoping process should be postmarked no later than June 6, 1996, to Commanding Officer, Southwest Division, Naval Facilities Engineering Command, 1220 Pacific Highway, San Diego, CA 92132-5190 (Attention: Ms. Kelly Knight, Code 232.KK). Ms. Knight may be reached by phone at (619) 532-1158 or by fax at (619) 532-3824.

Dated: April 26, 1996. M. A. Waters, LCDR, JAGC, USN, Federal Register Liaison Officer. [FR Doc. 96-10744 Filed 4-30-96; 8:45 am] BILLING CODE 3810-FF-M

A.4 NOTICE OF AVAILABILITY/PUBLIC HEARING FOR THE DEIS

The notice of availability (NOA) for the DEIS was published in the Federal Register on November 21, 1997 (Volume 62, Number 225). The NOA announced the availability of the DEIS for public review, the start of the review period, the dates and locations of the public hearings, and the address and deadline to provide comments. Navy response to comments received during this review period are included in this EIS.

Public hearings to receive oral comments on the DEIS were held in the City of El Centro on Monday, December 8, 1997, the City of Oxnard on Tuesday, December 9, and the City of Lemoore on Wednesday, December 10, 1997. The Federal Register notice is provided on the following pages.

FEDERAL REGISTER NOTICE

Federal Register: November 21, 1997 (Volume 62, Number 225) [Page 62292-62293]
From the Federal Register Online via GPO Access [wais.access.gpo.gov]

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DEPARTMENT OF DEFENSE, Department of the Navy, Notice of Public Hearing for the Draft Environmental Impact Statement (DEIS) for the Realignment of E-2 Squadrons From Naval Air Station (NAS) Miramar

SUMMARY: Pursuant to the Council on Environmental Quality regulations (40 CFR parts 1500-1508) implementing the procedural provisions of the National Environmental Policy Act, the Department of the Navy has prepared and filed with the U.S. Environmental Protection Agency a Draft Environmental Impact Statement (DEIS) for the realignment of E-2 squadrons from NAS Miramar. The DEIS also has been prepared in accordance with the Defense Base Closure and Realignment Act of 1990 (DBCRA, P.L. 101-510) and the pertinent base closure and realignment decisions of the Defense Base Closure and Realignment Commission approved by the President and accepted by Congress in September 1993 and September 1995.

The proposed action is to relocate four E-2 aircraft squadrons (16 aircraft) and related support personnel, equipment and functions from NAS Miramar to one of three alternative naval air bases in California. The proposed action includes relocating the 16 E-2 aircraft, 988 associated personnel and their families, and expanding or constructing facilities to support aircraft and personnel, and to provide associated training functions. In addition to the increased staffing and equipment levels, there would be an increase in Navy training and an increase in flight operations at the receiving installation. The preferred alternative is realignment of the E-2 squadrons to Naval Air Weapons Station (NAWS) Point Mugu, CA. Two other alternative sites were evaluated in detail: (1) Naval Air Station (NAS) Lemoore, CA, and (2) Naval Air Facility (NAF) El Centro, CA. NAS North Island was initially considered as a potential alternative base, but was eliminated because of the need to support Clean Air requirements with regard to the BRAC-mandated Marine Corps realignment to MCAS Miramar.

A Notice of Intent (NOI) for the DEIS was published in the Federal Register on May 1, 1996. Public scoping meetings were held at the following locations: (1) On Tuesday, May 21, 1996, at the Oxnard Center for Performing Arts, Thousand Oaks/Hueneme Room, 800 Hobson Way, Oxnard, CA; (2) On Thursday, May 23, 1996, at the Board of Supervisors Chambers, County Administration Center (Second Floor), 940 West Main Street, El Centro, CA; (3) On Tuesday, May 28, 1996, at Coronado High School Auditorium, 650 D Avenue, Coronado, CA; and (4) On Wednesday, May 29, 1996, at Lemoore Union High School Cafeteria, Back Room, 101 East Bush Street, Lemoore, CA.

The DEIS analyzes potential environmental impacts of the proposed action on biological resources, hydrology/surface water quality, land use and airspace, socioeconomics, traffic and circulation, air quality, noise, aesthetics and visual resources, utilities and services, cultural resources, public health and safety, and hazardous materials and wastes. Potentially significant, but mitigable, environmental impacts include impacts to air quality, schools, and cultural resources at NAWS Point Mugu; air quality and schools at NAS Lemmore; and biological resources, noise/land use compatibility, and conflict with existing aircraft operations at NAF El Centro.

No decision on the proposed action will be made until the NEPA process has been completed. The DEIS has been distributed to various federal, state and local agencies, local groups, elected officers, special interest groups and individuals. The DEIS is available for review at the following libraries:

Near NAWS Point Mugu

–City of Camarillo Public Library, 3100 Ponderosa Drive, Camarillo, CA;
–City of Oxnard Public Library, 251 South A Street, Oxnard, CA;
–City of Port Hueneme Public Library, 510 Park Avenue, Port Hueneme, CA;

FEDERAL REGISTER NOTICE *(continued)*

–City of Santa Barbara Public Library, 40 East Anapamu Street, Santa Barbara, CA;
–City of Ventura Public Library, 651 East Main Street, Ventura, CA; and
–Ventura City College Library, 4667 Telegraph Road, Ventura, CA.

Near NAF El Centro

–City of Brawley Public Library, 400 Main Street, Brawley, CA; and
–City of El Centro Public Library, 539 State Street, El Centro, CA.

Near NAS Lemoore

–City of Avenal Public Library, 919 Skyline Boulevard, Avenal, CA;
–City of Lemoore Public Library, 457 C Street, Lemoore, CA;
–City of Hanford Public Library, 400 North Douty, Hanford, CA; and
–City of Fresno Public Library, 2420 Mariposa Street, Fresno, CA.

Near NAS North Island

–City of Coronado Public Library, 640 Orange Avenue, Coronado, CA;
–National City Public Library, 200 East 12th Street, National City, CA;
–City of Imperial Beach Public Library, 810 Imperial Beach Blvd., Imperial Beach, CA; and
–City of San Diego Public Library, 820 E Street, San Diego, CA.

ADDRESSES: The Navy will conduct three public hearings to receive oral and written comments concerning the DEIS: (1) On Monday, December 8, 1997, at 7:00 p.m., at Imperial County Administration Center, Board of Supervisors Chambers, 940 Main Street, El Centro, CA; (2) On Tuesday, December 9, 1997, at 7:00 p.m., at Oxnard Center for Performing Arts, Thousand Oaks/Hueneme Room, 800 Hobson Way, Oxnard, CA; and (3) On Wednesday, December 10, 1997, at 7:00 p.m., at Lemoore Civic Auditorium, 435 C Street, Lemoore, CA.

A brief presentation will precede a request for public information and comments. Navy representatives will be available at these hearings to receive information and comments from agencies and the public regarding issues of concern. Federal, state and local agencies, and interested individuals are invited to be present or represented at the hearings. Oral comments will be heard and transcribed by a stenographer. To assure accuracy of the record, all comments should be submitted in writing. All comments, both oral and written, will become part of the public record in the study. In the interest of available time, each speaker will be asked to limit oral comments to four minutes. Longer comments should be summarized at the public hearing and submitted in writing either at the hearing or mailed to the address listed below.

FOR FURTHER INFORMATION CONTACT: Please provide written comments by January 5, 1998, to Ms. Kelly Knight, Code 553.KK, Southwest Division, Naval Facilities Engineering Command, 1220 Pacific Highway, San Diego, California 92132-5190, telephone (619) 532-2456, fax (619) 532-1242.

Dated: November 18, 1997. Darse E. Crandall, LCDR, JAGC, USN, Federal Register Liaison Officer. [FR Doc. 97-30673 Filed 11-20-97; 8:45 am] BILLING CODE 3810-FF-P

A.5 NEWSPAPER ADVERTISEMENT

Newspaper advertisements announcing the preparation of this EIS, the start of the public scoping process, and notice of availability of the DEIS were published in local newspapers serving the areas surrounding each alternative receiving installation. Newspapers and publication dates for the notice of intent and notice of availability are provided in Table A-5 and Table A-6, respectively. Sample newspaper advertisements are included on the following pages.

Table A-5
Newspapers and Publication Dates for the Notice of Intent

Newspaper	Publication Dates
Hanford Sentinel	Wednesday, May 15 and Sunday, May 19, 1996
Lemoore Advance	Thursday, May 16 and Thursday, May 23, 1996
Fresno Bee	Wednesday, May 15 and Sunday, May 19, 1996
Imperial Valley Press	Wednesday, May 8 and Sunday, May 12, 1996
San Diego Union Tribune	Sunday, May 12 and Wednesday, May 15, 1996
Eagle (Coronado)	Wednesday, May 22, 1996
Coronado Journal	Friday, May 17, 1996
Ventura County Star	Sunday, May 5 and Wednesday, May 8, 1996
Los Angeles Times, Ventura County Edition	Sunday, May 5 and Wednesday, May 8, 1996

Table A-6
Newspapers and Publication Dates for the Notice of Availability

Newspaper	Publication Dates
Hanford Sentinel	Friday, November 21 and Sunday, November 23, 1997
Lemoore Advance	Friday, November 21 and Monday, November 24, 1997
Fresno Bee	Friday, November 21 and Sunday, November 23, 1997
Imperial Valley Press	Friday, November 21 and Sunday, November 23, 1997
San Diego Union Tribune	Friday, November 21 and Sunday, November 23, 1997
Ventura County Star	Friday, November 21 and Sunday, November 23, 1997
Los Angeles Times, Ventura County Edition	Friday, November 21 and Sunday, November 23, 1997

A.5 NEWSPAPER ADVERTISEMENT *(continued)*

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LEGAL NOTICES

NOTICE OF INTENT TO PREPARE AN ENVIRONMENTAL IMPACT STATEMENT FOR THE REALIGNMENT OF E-2 AIRCRAFT SQUADRONS FROM NAVAL AIR STATION, MIRAMAR

Pursuant to Section 102(2)(c) of the National Environmental Policy Act of 1969, as implemented by the Council on Environmental Quality (CEQ) regulations (40 CFR Parts 1500-1508), the Department of the Navy announces its intent to prepare an Environmental Impact Statement (EIS) to evaluate the environmental effects of realigning the Airborne Early Warning Wing (AEWWING), consisting of four E-2 aircraft squadrons and associated personnel, presently located at Naval Air Station (NAS) Miramar to another naval air station with compatible mission and function.

The realignment is in accordance with the legislative requirements of the Defense Base Closure and Realignment Act (DBCRA) of 1990 (Public Law 101-510), as implemented by the Base Realignment and Closure (BRAC) processes of 1993 and 1995. BRAC 1993 and 1995 directed the closure of Marine Corps Air Stations (MCAS) El Toro and Tustin and realigned aviation units, functions and personnel at MCAS El Toro and MCAS Tustin to NAS Miramar and MCAS Camp Pendleton. The Navy and Marine Corps agreed to transfer ownership of NAS Miramar from Nave to Marine Corps in September 1997. Accordingly, the four AEWWING squadrons must be relocated from their present location at NAS Miramar.

The proposed action entails relocating four E-2 squadrons (16 aircraft), as well as related support personnel, equipment, and functions from NAS Miramar to another naval air station. The Navy has identified NAS North Island, NAS Lemore, Naval Air Warfare Center (NAWC) Point Mugu and Naval Air Facility (NAF) El Centro as potential receiving sites for the relocated squadrons. To accommodate the AEWWING relocation, military construction projects (new construction, expansion, modification or demolition) would be necessary at any receiving site under consideration. The amount of construction required is dependent upon availability and compatibility of existing space at each alternative base. In all cases, new or modified hangar space, aircraft parking aprons, maintenance facilities and E-2 specific training facilities would be required. Construction or modification of community support facilities would be based on the adequacy and capacity of existing resources at each base.

The Navy intends to analyze the environmental effects of the realignment and potential construction at the four alternative base locations. Major environmental issues that will be addressed in the EIS include, but are not limited to: geology/soils/seismicity; biology; water resources/hydrology/drainage/flood control; noise; air quality/conformity; land use; cultural resources; socioeconomics; transportation/circulation; public health and safety/hazardous materials, aesthetics; public services/utilities; and environmental justice.

The Navy will initiate a scoping process for the purpose of determining the extent of issues to be addressed and identifying the significant issues related to he AEWWING realignment. The public and interested parties are invited to participate in the scoping process, to review the draft EIS, and to attend a public meeting on the draft EIS. Public scoping meetings will be conducted at all four alternative base locations on the following dates starting at 7:00 p.m.:

- Tuesday, May 21, 1996 at the Oxnard Center for Performing Arts, Thousand Oaks/Hueneme Room, 800 Hobson Way, Oxnard, California.
- Thursday, May 23, 1996 at the Board of Supervisors Chambers, County Administration Center (Second Floor), 940 West Main Street, El Centro, California.
- Tuesday, May 28, 1996 at Coronado High School Auditorium, 650 D Avenue, Coronado, California.
- Wednesday, May 29, 1996 at Lemoore Union High School, Cafeteria, Back Room, 101 East Bush Street, Lemoore, California.

A brief presentation on the proposed action will precede the request for public comment. Navy representatives will be available at these meetings to receive comments from the public regarding issues of concern. It is important that federal, state, local agencies and interested individuals take this opportunity to identify environmental concerns that should be addressed during the preparation of the draft EIS. In the interest of time, speakers will be asked to limit comments to five (5) minutes.

Agencies and the public are invited and encouraged to provide written comments in addition to, or in lieu of, oral comments at the public scoping meetings. To be most helpful, scoping comments should clearly describe specific issues or topics which the commentor believes the draft EIS should address. Written statements or questions regarding the scoping process should be postmarked no later than June 6, 1996, to Commanding Officer, Southwest Division, Naval Facilities Engineering Command, 1220 Pacific Highway, San Diego, CA 92132-5190 (Attention: Ms. Kelly Knight, Code 232.KK). Ms. Knight may be reached by phone at (619) 532-1158 or by fax at (619) 532-3824.

A.5 NEWSPAPER ADVERTISEMENT *(continued)*

1250
LEGAL NOTICES

DEPARTMENT OF DEFENSE
DEPARTMENT OF THE NAVY

NOTICE OF AVAILABILITY OF THE DRAFT ENVIRONMENTAL IMPACT STATEMENT (EIS) FOR THE REALIGNMENT OF E-2 SQUADRONS FROM NAVAL AIR STATION (NAS) MIRAMAR

Pursuant to Section 102(2)(c) of the National Environmental Policy Act (NEPA) of 1969 as amended, the Council on Environmental Quality implementing regulations (Title 40 Code of Federal Regulations Parts 1500-1508); and the Department of the Navy's (Navy) NEPA implementing regulations (OPNAVINST [Office of the Chief of Naval Operations Instruction] 5090.1B), the Navy has prepared and filed with the US Environmental Protection Agency, a Draft Environmental Impact Statement (DEIS) for the proposed realignment of four E-2 squadrons from Naval Air Station (NAS) Miramar to another naval air station. The DEIS also has been prepared in accordance with the Defense Base Closure and Realignment Act of 1990 (DBCRA, Public Law 101-510) and the pertinent base closure and realignment decisions of the Defense Base Closure and Realignment Commission approved by the President and accepted by Congress in September 1993 and September 1995.

The purpose of the proposed action is to relocate four E-2 aircraft squadrons (16 aircraft) and related support personnel, equipment, and functions from NAS Miramar to one of three alternative naval bases in California. The proposed action includes relocating the 16 E-2 aircraft, 988 associated personnel and their families, and expanding or constructing facilities to support aircraft and personnel, and to provide associated training functions. In addition to the increased staffing and equipment levels, there would be an increase in Navy training and an increase in flight operations at the receiving installation. The preferred alternative includes realignment of the E-2 squadrons to Naval Air Weapons Station (NAWS) Point Mugu. Two other alternative sites were evaluated in detail: 1) Naval Air Station (NAS) Lemoore, and 2) Naval Air Facility (NAF) El Centro. NAS North Island was initially considered as a potential alternative base, but was eliminated due to the need to support Clean Air Act requirements with regard to the BRAC-mandated Marine Corps realignment to MCAS Miramar.

The DEIS analyzes potential environmental impacts of the proposed action on biological resources, hydrology/surface water quality, land use and airspace, socioeconomics, traffic and circulation, air quality, noise, aesthetics and visual resources, utilities and services, cultural resources, public health and safety, and hazardous materials and wastes. Potentially significant and mitigable environmental impacts include impacts to air quality, schools, and cultural resources at NAWS Point Mugu, air quality and schools at NAS Lemoore, and biological resources, noise/land use compatibility, and exceedence of imaginary surfaces (aircraft operations) at NAF El Centro. No unavoidable adverse impacts were identified.

Three public hearings to receive oral and written comments concerning the DEIS will be held at 7:00 p.m. on the following dates:

Monday, December 8, 1997

Imperial County Administration Center
Board of Supervisors Chambers
940 Main Street
El Centro, California
(760) 339-4220

Tuesday, December 9, 1997

Oxnard Center for Performing Arts
Thousand Oaks/Hueneme Room
800 Hobson Way
Oxnard, California
(805) 385-8147

Wednesday, December 10, 1997

Lemoore Civic Auditorium
435 C Street
Lemoore, California
(209) 924-6700

The DEIS is available for review at the following public libraries:

Near NAWS Point Mugu

City of Camarillo Public Library,
3100 Ponderosa Drive,
Camarillo, CA
City of Oxnard Public Library
251 South A Street, Oxnard, CA
City of Port Hueneme
Public Library
510 Park Avenue,
Port Hueneme, CA
City of Santa Barbara
Public Library
40 East Anapamu Street,
Santa Barbara, CA
City of Ventura Public Library
651 East Main Street,
Ventura, CA
Ventura City College Library,
4667 Telegraph Road,
Ventura, CA

Near NAF El Centro

City of Avenal Public Library
919 Skyline Boulevard, Avenal, CA
City of Brawley Public Library,
400 Main Street, Brawley, CA
City of El Centro Public Library
539 State Street, El Centro, CA
City of Imperial Beach
Public Library
810 Imperial Beach Blvd.,
Imperial Beach, CA

Near NAS Lemoore

City of Lemoore Public Library,
457 C Street, Lemoore, CA
City of Hanford Public Library,
400 North Douty, Hanford, CA
City of Fresno Public Library
2420 Mariposa Street, Fresno, CA

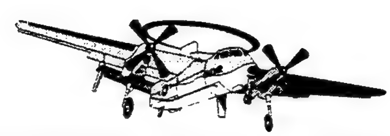
Near NAS North Island

City of Coronado Public Library
640 Orange Avenue, Coronado, CA
National City Public Library
200 East 12th Street,
National City, CA
City of San Diego Public Library
820 E Street, San Diego, CA

Written comments concerning the DEIS must be submitted no later than January 5, 1998 to:

Naval Facilities
Engineering Command
Southwest Division
Attn: Ms. Kelly Knight
1220 Pacific Highway, Code 553.KK
San Diego, California 92132-5190

For additional information on the DEIS, contact Ms. Kelly Knight at the address shown above, or by telephone (619) 532-2456 or fax (619) 532-1242.



Appendix B. Biological Resources

B. Biological Resources

APPENDIX B
BIOLOGICAL RESOURCES

This appendix includes Endangered Species Act conformity letters from the Navy to the US Fish and Wildlife Service Ventura, Sacramento, and Carlsbad field offices, and their corresponding responses and threatened and endangered species lists.

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
Ser 553.KK/105
June 23, 1997

Ms. Diane Noda, Field Supervisor
US Fish and Wildlife Service (USFWS)
Ventura Field Office
2493 Portola Road, Suite B
Ventura, CA 93003

Subject: SPECIES LIST FOR THE E-2 AIRCRAFT REALIGNMENT ENVIRONMENTAL IMPACT STATEMENT

Dear Ms. Noda:

The Department of the Navy is preparing an environmental impact statement (EIS) in accordance with the National Environmental Policy Act, the Defense Base Closure and Realignment Act of 1990 (Public Law 101-150), and specific base closure and realignment decisions approved by the President and accepted by Congress in September 1995. The purpose of this letter is to coordinate the planned realignment with your agency with regard to conformity with the Endangered Species Act (87 Stat. 884, as amended; 16 USC 1531 et seq.).

The proposed action to be analyzed in the EIS is the realignment of four E-2 squadrons (16 aircraft) and support activities from Naval Air Station (NAS) Miramar to another naval air station. The EIS will analyze the environmental impacts of constructing and/or operating airfield, training, maintenance and personnel support facilities required to carry on the E-2 mission at four alternative base locations—Naval Air Facility (NAF) El Centro, NAS North Island, Naval Air Weapons Station (NAWS) Point Mugu and NAS Lemoore. A description of the proposed action and alternatives is enclosed.

Publication of the Draft EIS is scheduled for October 1997. As part of our consultation with your agency, we request a listing of endangered, threatened, proposed, and candidate species inhabiting the area including their critical habitat, if identified. If possible, please identify which candidate species are likely to be listed prior to the completion of our proposed action in 2000. To assist with your records search, we have identified the US Geological Survey maps applicable to NAWS Point Mugu as the Point Mugu, Camarillo, and Oxnard California quadrangles.

5090
Ser 553.KK/105
June 23, 1997

To facilitate the EIS schedule, we would appreciate receiving your comments within 15 days. Please mail or fax them to:

Ms. Kelly Knight, Project Manager
Naval Facilities Engineering Command, Southwest Division
1220 Pacific Highway, Code 553.KK
San Diego, CA 92132-5190
Fax (619) 532-1242

If you have any questions regarding the proposed action or the EIS, please contact the undersigned at (619) 532-2456.

Kelly K Knight

Kelly K. Knight
By direction of the
Commanding Officer

Enclosure (1) Proposed Action and Alternatives

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
Ser 553.KK/105
June 23,1997

Mr. Wayne White, Field Supervisor
US Fish and Wildlife Service (USFWS)
Sacramento Field Office
3310 El Camino Avenue, Suite 130
Sacramento, CA 95821

Subject: SPECIES LIST FOR THE E-2 AIRCRAFT REALIGNMENT ENVIRONMENTAL IMPACT STATEMENT

Dear Mr. White:

The Department of the Navy is preparing an environmental impact statement (EIS) in accordance with the National Environmental Policy Act, the Defense Base Closure and Realignment Act of 1990 (Public Law 101-150), and specific base closure and realignment decisions approved by the President and accepted by Congress in September 1995. The purpose of this letter is to coordinate the planned realignment with your agency with regard to conformity with the Endangered Species Act (87 Stat. 884, as amended; 16 USC 1531 et seq.).

The proposed action to be analyzed in the EIS is the realignment of four E-2 squadrons (16 aircraft) and support activities from Naval Air Station (NAS) Miramar to another naval air station. The EIS will analyze the environmental impacts of constructing and/or operating airfield, training, maintenance and personnel support facilities required to carry on the E-2 mission at four alternative base locations—Naval Air Facility (NAF) El Centro, NAS North Island, Naval Air Weapons Station (NAWS) Point Mugu and NAS Lemoore. A description of the proposed action and alternatives is enclosed.

Publication of the Draft EIS is scheduled for October 1997. As part of our consultation with your agency, we request a listing of endangered, threatened, proposed, and candidate species inhabiting the area including their critical habitat, if identified. If possible, please identify which candidate species are likely to be listed prior to the completion of our proposed action in 2000. To assist with your records search, we have identified the US Geological Survey map applicable to NAS Lemoore as the Vanguard, California quadrangle.

5090
Ser 553.KK/105
June 23, 1997

To facilitate the EIS schedule, we would appreciate receiving your comments within 15 days. Please mail or fax them to:

Ms. Kelly Knight, Project Manager
Naval Facilities Engineering Command, Southwest Division
1220 Pacific Highway, Code 553.KK
San Diego, CA 92132-5190
Fax (619) 532-1242

If you have any questions regarding the proposed action or the EIS, please contact the undersigned at (619) 532-2456.

Kelly K Knight

Kelly K. Knight
By direction of the
Commanding Officer

Enclosure (1) Proposed Action and Alternatives

DEPARTMENT OF THE NAVY
SOUTHWEST DIVISION
NAVAL FACILITIES ENGINEERING COMMAND
1220 PACIFIC HIGHWAY
SAN DIEGO, CA 92132-5190

5090
Ser 553.KK/105
June 23, 1997

Mr. John Bradley, Branch Chief
US Fish and Wildlife Service (USFWS)
Carlsbad Field Office
2730 Loker Avenue West
Carlsbad, CA 92008

Subject: SPECIES LIST FOR THE E-2 AIRCRAFT REALIGNMENT ENVIRONMENTAL IMPACT STATEMENT

Dear Mr. Bradley:

The Department of the Navy is preparing an environmental impact statement (EIS) in accordance with the National Environmental Policy Act, the Defense Base Closure and Realignment Act of 1990 (Public Law 101-150), and specific base closure and realignment decisions approved by the President and accepted by Congress in September 1995. The purpose of this letter is to coordinate the planned realignment with your agency with regard to conformity with the Endangered Species Act (87 Stat. 884, as amended; 16 USC 1531 et seq.).

The proposed action to be analyzed in the EIS is the realignment of four E-2 squadrons (16 aircraft) and support activities from Naval Air Station (NAS) Miramar to another naval air station. The EIS will analyze the environmental impacts of constructing and/or operating airfield, training, maintenance and personnel support facilities required to carry on the E-2 mission at four alternative base locations—Naval Air Facility (NAF) El Centro, NAS North Island, Naval Air Weapons Station (NAWS) Point Mugu and NAS Lemoore. A description of the proposed action and alternatives is enclosed.

Publication of the Draft EIS is scheduled for October 1997. As part of our consultation with your agency, we request a listing of endangered, threatened, proposed, and candidate species inhabiting the area including their critical habitat, if identified. If possible, please identify which candidate species are likely to be listed prior to the completion of our proposed action in 2000. To assist with your records search, we have identified the US Geological Survey map applicable to NAS North Island as the Point Loma, California quadrangle and for NAF El Centro we have identified the Seeley, California quadrangle.

5090
Ser 553.KK/105
June 23, 1997

To facilitate the EIS schedule, we would appreciate receiving your comments within 15 days. Please mail or fax them to:

Ms. Kelly Knight, Project Manager
Naval Facilities Engineering Command, Southwest Division
1220 Pacific Highway, Code 553.KK
San Diego, CA 92132-5190
Fax (619) 532-1242

If you have any questions regarding the proposed action or the EIS, please contact the undersigned at (619) 532-2456.

Kelly K Knight

Kelly K. Knight
By direction of the
Commanding Officer

Enclosure (1) Proposed Action and Alternatives

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Ventura Fish and Wildlife Office
2493 Portola Road, Suite B
Ventura, California 93003

July 29, 1997

Kelly K. Knight, Project Manager
Naval Facilities Engineering Command, Southwest Division
1220 Pacific Highway, Code 553.KK
San Diego, California 92132-5190

Subject: Species List for Point Mugu Naval Air Warfare Center and San Nicolas Island, Ventura County, California

Dear Ms. Knight:

This letter is in response to your request for information on listed, proposed, and candidate species that may occur in the vicinity of the Point Mugu Naval Air Weapons Station and San Nicolas Island, Ventura County, California. Your request was received by the U.S. Fish and Wildlife Service (Service) on June 27, 1997. The requested information will be used by the Department of the Navy (Navy) as part of its project analysis for assessing the effects of its realignment of four E-2 squadrons and support activities from another Naval Air Station. We recommend you contact our Sacramento Fish and Wildlife Office for a list of species for your facility at Lemoore, Kings County, California and our Carlsbad Fish and Wildlife Office for lists of species for the facilities at El Centro and North Island.

If the proposed project may affect a listed species, the Navy, as lead Federal agency, has the responsibility to prepare a biological assessment if the project is a construction project which may require an environmental impact statement[1/]. If a biological assessment is not required, the Navy still has the responsibility to review its proposed activities and determine whether the listed species will be affected.

During the assessment or review process, the Navy may engage in planning efforts, but may not make any irreversible commitment of resources. Such a commitment could constitute a violation of section 7(d) of the Endangered Species Act of 1973 as amended (Act). If a listed species may be affected, the Navy should request, in writing through our office, consultation pursuant to section 7 of the Act. Informal consultation may be used to exchange information and resolve conflicts with respect to listed species prior to a written request for formal consultation.

Federal agencies are required to confer with the Service, pursuant to section 7(a)(4) of the Act, when an agency action is likely to jeopardize the continued existence of any proposed species or result in the destruction or adverse modification of proposed critical habitat (50 CFR 402.10(a)). A request for formal conference must be in writing and should include the same information that would be provided for a request for formal consultation. Conferences can also include discussions between the Service and the Federal agency to identify and resolve potential conflicts between an action and proposed species or proposed critical habitat early in the decision-making process. The Service recommends ways to minimize or avoid adverse effects of the action. These recommendations are advisory because the jeopardy prohibition of section 7(a)(2) of the Act does not apply until the species is listed or the proposed critical habitat is designated. The conference process fulfills the need to inform Federal agencies of possible steps that an agency might take at an early stage to adjust its actions to avoid jeopardizing a proposed species.

When a proposed species or proposed critical habitat may be affected by an action, the lead Federal agency may elect to enter into formal conference with the Service even if the action is not likely to jeopardize or result in the destruction or adverse modification of proposed critical habitat. If the proposed species is listed or the proposed critical habitat is designated after completion of the conference, the Federal agency may ask the Service, in writing, to confirm the conference as a formal consultation. If the Service reviews the proposed action and finds that no significant changes in the action as planned or in the information used during the conference have occurred, the Service will confirm the conference as a formal consultation on the project and no further section 7 consultation will be necessary. Use of the formal conference process in this manner can prevent delays in the event the proposed species is listed or the proposed critical habitat is designated during project development or implementation.

I have enclosed a list of threatened, endangered, and candidate species. To the best of our present knowledge, no species proposed for listing are known to occur in the vicinity of the action. We recently rediscovered the Ventura marsh milk-vetch (*Astragalus pycnostachyus* var. *lanosissimus*) in the vicinity of Oxnard, Ventura County. This species was thought to be extinct and was once known from the vicinity of Pt. Mugu. It is currently a Federal species of concern. However, its Federal status may change. Therefore, we added it to the enclosed list of species. We recommend that you review information in the California Department of Fish and Game's Natural Diversity Data Base to determine whether any additional species of concern occur in the area. We also recommend you contact the National Marine Fisheries Service for species under its jurisdiction.

Should you have any questions regarding the species on the enclosed list or your responsibilities under the Act, please contact Kate Symonds of my staff at (805) 644-1766.

Sincerely,

Diane K. Noda

Diane K. Noda
Field Supervisor

Enclosure

1/ "Construction Project" means any major Federal action which significantly affects the quality of the human environment designed primarily to result in the building or erection of man-made structures such as dams, buildings, roads, pipelines, channels and the like. This includes Federal actions such as permits, grants, licenses, or other forms of Federal authorizations or approval which may result in construction.

LISTED AND CANDIDATE SPECIES WHICH MAY OCCUR IN THE VICINITY OF POINT MUGU NAVAL AIR WEAPONS CENTER AND SAN NICOLAS ISLAND, VENTURA COUNTY, CALIFORNIA

Mammals		
Southern sea otter **	*Enhydra lutris nereis*	T
Birds		
American peregrine falcon **	*Falco peregrinus anatum*	E
Brown pelican **	*Pelecanus occidentalis*	E
California least tern	*Sterna antillarum browni*	E
Light-footed clapper rail	*Rallus longirostris levipes*	E
Western snowy plover **	*Charadrius alexandrinus nivosus*	T, PCH
Reptiles		
Island night lizard *	*Xantusia riversiana*	T
Plants		
Salt marsh bird's-beak	*Cordylanthus maritimus* ssp. *maritimus*	E
Ventura marsh milk-vetch	*Astragalus pycnostachyus* var. *lanosissimus*	

Key:
E - Endangered
T - Threatened
PCH - Proposed Critical Habitat
C - Candidate species for which the Fish and Wildlife Service has on file sufficient information on the biological vulnerability and threats to support proposals to list as endangered or threatened.

* - indicates species found only on San Nicolas Island
** - indicates species that may occur on both San Nicolas Island and at Point Mugu

Portions of the above list were generated through use of the California Department of Fish and Game's Natural Diversity Data Base. Verification of the accuracy of this information is the responsibility of the project proponent; field surveys during the appropriate seasons may be required. If you have any questions about the Natural Diversity Data Base, contact the California Department of Fish and Game at (916) 324-3812.

United States Department of the Interior

FISH AND WILDLIFE SERVICE

Sacramento Fish and Wildlife Office
3310 El Camino Avenue, Suite 130
Sacramento, California 95821-6340

IN REPLY REFER TO:
1-1-97-SP-1655

August 11, 1997

Ms. Kelly Knight, Project Manager
Naval Facilities Engineering Command, Southwest Division
1220 Pacific Highway, Code 553.KK
San Diego, Callifornia 92132-5190

Subject: Species Lists for Proposed E-2 Aircraft Realignment EIS, Lemoore

Dear Ms. Knight:

As requested by letter from your agency dated June 23, 1997, you will find enclosed lists of sensitive species that may be present in *or may be affected by* projects in the subject project area (see Enclosure A). These lists fulfill the requirement of the Fish and Wildlife Service (Service) to provide species lists pursuant to section 7(c) of the Endangered Species Act of 1973, as amended (Act).

The Service used the information in your letter to locate the proposed project on a U.S. Geological Survey (USGS) 7.5 minute quadrangle map. The animal species on the Enclosure A quad list[s] are those species we believe may occur within, *or be affected by projects within*, the QUAD 336C, and counties of Fresno and Kings, where your project is planned.

Any plants on the Enclosure A quad list[s] are those *that have actually been observed* in the project quad[s]. Plants on the county list[s] may also occur in the quad[s] where your project is planned.

Some of the species listed in Enclosure A may not be affected by the proposed action. A trained biologist or botanist, familiar with the habitat requirements of the listed species, should determine whether these species or habitats suitable for these species may be affected by the proposed action. For plant surveys, the Service recommends using the enclosed Guidelines for Conducting and Reporting Botanical Inventories for Federally Listed, Proposed and Candidate Species (Enclosure C).

Some pertinent information concerning the distribution, life history, habitat requirements, and published references for the listed species is available upon request. This information may be helpful in preparing the biological assessment for this project, if one is required. Please see Enclosure B for a discussion of the responsibilities Federal agencies have under section 7(c) of the Act and the conditions under which a biological assessment must be prepared by the lead Federal agency or its designated non-Federal representative.

Formal consultation, pursuant to 50 CFR § 402.14, should be initiated if you determine that a listed species may be affected by the proposed project. If you determine that a proposed species may be adversely affected, you should consider requesting a conference with our office pursuant to 50 CFR § 402.10. Informal consultation may be utilized prior to a written request for formal consultation to exchange information and resolve conflicts with respect to a listed species. If a biological assessment is required, and it is not initiated within 90 days of your receipt of this letter, you should informally verify the accuracy of this list with our office.

Candidate species are currently being reviewed by the Service and are under consideration for possible listing as endangered or threatened. Candidate species have no protection under the Endangered Species Act, but are included for your consideration as it is possible that one or more of these candidates could be proposed and listed before the subject project is completed. Should the biological assessment reveal that candidate species may be adversely affected, you may wish to contact our office for technical assistance. One of the potential benefits from such technical assistance is that by exploring alternatives early in the planning process, it may be possible to avoid conflicts that could otherwise develop, should a candidate species become listed before the project is completed.

In the Federal Register of February 28, 1996, the Service changed its policy on candidate species. The term *candidate* now strictly refers to species for which the Service has on file enough information to propose listing as endangered or threatened. Former *category 2 candidate* species - species for which listing is possibly appropriate but for which the Service lacks sufficient information to support a listing proposal - are now called *species of concern*. They are no longer monitored by the Service. However we have retained them on the enclosed list for general information. We encourage consideration of them in project planning, as they may become candidate species in the future.

If the proposed project will impact wetlands, riparian habitat, or other jurisdictional waters as defined by the U.S. Army Corps of Engineers (Corps), a Corps permit will be required, pursuant to section 404 of the Clean Water Act and/or section 10 of the Rivers and Harbors Act. Impacts to wetland habitats require site specific mitigation and monitoring. You may request a copy of the Service's General Mitigation and Monitoring Guidelines or submit a detailed description of the proposed impacts for specific comments and recommendations. If you have any questions regarding wetlands, contact Mark Littlefield at (916) 979-2113.

Ms. Kelly Knight, Project Manager

Please contact Peter Cross at (916) 979-2725 if you have any questions regarding the attached list or your responsibilities under the Endangered Species Act. For the fastest response to species list requests, address them to the attention of the section 7 office assistant at this address.

Sincerely,

Patricia Leonard

for Wayne S. White
Field Supervisor

Enclosures

ENCLOSURE A

Endangered and Threatened Species that May Occur in or be Affected by Projects in the Following Selected Quads

Reference File No. 1655

August 10, 1997

QUAD : 336C VANGUARD

Listed Species

Mammals

giant kangaroo rat, *Dipodomys ingens* (E)

Fresno kangaroo rat, *Dipodomys nitratoides exilis* (E)

Tipton kangaroo rat, *Dipodomys nitratoides nitratoides* (E)

San Joaquin kit fox, *Vulpes macrotis mutica* (E)

Birds

American peregrine falcon, *Falco peregrinus anatum* (E)

Aleutian Canada goose, *Branta canadensis leucopareia* (T)

bald eagle, *Haliaeetus leucocephalus* (T)

Reptiles

blunt-nosed leopard lizard, *Gambelia (=Crotaphytus) silus* (E)

giant garter snake, *Thamnophis gigas* (T)

Amphibians

California red-legged frog, *Rana aurora draytonii* (T)

Fish

delta smelt, *Hypomesus transpacificus* (T)

Invertebrates

vernal pool fairy shrimp, *Branchinecta lynchi* (T)

valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)

Candidate Species

Birds

mountain plover, *Charadrius montanus* (C)

Species of Concern

Mammals

Nelson's antelope ground squirrel, *Ammospermophilus nelsoni* (SC)

short-nosed kangaroo rat, *Dipodomys nitratoides brevinasus* (SC)

greater western mastiff-bat, *Eumops perotis californicus* (SC)

QUAD : 336C VANGUARD

Species of Concern

Mammals

small-footed myotis bat, *Myotis ciliolabrum* (SC)

fringed myotis bat, *Myotis thysanodes* (SC)

long-legged myotis bat, *Myotis volans* (SC)

Yuma myotis bat, *Myotis yumanensis* (SC)

Tulare grasshopper mouse, *Onychomys torridus tularensis* (SC)

San Joaquin pocket mouse, *Perognathus inornatus* (SC)

Pacific western big-eared bat, *Plecotus townsendii townsendii* (SC)

Birds

western burrowing owl, *Athene cunicularia hypugea* (SC)

ferruginous hawk, *Buteo regalis* (SC)

little willow flycatcher, *Empidonax traillii brewsteri* (SC)

white-faced ibis, *Plegadis chihi* (SC)

Reptiles

northwestern pond turtle, *Clemmys marmorata marmorata* (SC)

southwestern pond turtle, *Clemmys marmorata pallida* (SC)

San Joaquin whipsnake, *Masticophis flagellum ruddocki* (SC)

California horned lizard, *Phrynosoma coronatum frontale* (SC)

Amphibians

western spadefoot toad, *Scaphiopus hammondii* (SC)

Invertebrates

molestan blister beetle, *Lytta molesta* (SC)

ENCLOSURE A

Endangered and Threatened Species that May Occur in or be Affected by
Projects in the Area of the Following California County or Counties
Reference File No. 1655

August 10, 1997

FRESNO COUNTY

Listed Species

Mammals

giant kangaroo rat, *Dipodomys ingens* (E)

Fresno kangaroo rat, *Dipodomys nitratoides exilis* (E)

Fresno kangaroo rat critical habitat, *Dipodomys nitratoides exilis* (E)

Tipton kangaroo rat, *Dipodomys nitratoides nitratoides* (E)

San Joaquin kit fox, *Vulpes macrotis mutica* (E)

Birds

American peregrine falcon, *Falco peregrinus anatum* (E)

California condor, *Gymnogyps californianus* (E)

Aleutian Canada goose, *Branta canadensis leucopareia* (T)

bald eagle, *Haliaeetus leucocephalus* (T)

Reptiles

blunt-nosed leopard lizard, *Gambelia (=Crotaphytus) silus* (E)

giant garter snake, *Thamnophis gigas* (T)

Amphibians

California red-legged frog, *Rana aurora draytonii* (T)

Fish

delta smelt, *Hypomesus transpacificus* (T)

Paiute cutthroat trout, *Oncorhynchus (=Salmo) clarki seleniris* (T)

Invertebrates

vernal pool fairy shrimp, *Branchinecta lynchi* (T)

valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)

Plants

California jewelflower, *Caulanthus californicus* (E)

palmate-bracted bird's-beak, *Cordylanthus palmatus* (E)

San Joaquin wooly-threads, *Lembertia congdonii* (E)

Hartweg's golden sunburst, *Pseudobahia bahiifolia* (E)

FRESNO COUNTY

Listed Species

Plants

San Joaquin adobe sunburst, *Pseudobahia peirsonii* (E)

San Benito evening-primrose, *Camissonia benitensis* (T)

fleshy owl's-clover, *Castilleja campestris ssp. succulenta* (T)

Hoover's wooly-star, *Eriastrum hooveri* (T)

San Joaquin Valley Orcutt grass, *Orcuttia inaequalis* (T)

Greene's tuctoria, *Tuctoria greenei* (E)

Proposed Species

Fish

Central Valley steelhead, *Oncorhynchus mykiss* (PE)

Sacramento splittail, *Pogonichthys macrolepidotus* (PT)

Plants

Mariposa pussy-paws, *Calyptridium pulchellum* (PE)

carpenteria, *Carpenteria californica* (PT)

Candidate Species

Mammals

San Joaquin Valley woodrat, *Neotoma fuscipes riparia* (C)

Birds

mountain plover, *Charadrius montanus* (C)

Amphibians

California tiger salamander, *Ambystoma californiense* (C)

Species of Concern

Mammals

Nelson's antelope ground squirrel, *Ammospermophilus nelsoni* (SC)

short-nosed kangaroo rat, *Dipodomys nitratoides brevinasus* (SC)

spotted bat, *Euderma maculatum* (SC)

greater western mastiff-bat, *Eumops perotis californicus* (SC)

California wolverine, *Gulo gulo luteus* (SC)

FRESNO COUNTY

Species of Concern

Mammals

- Pacific fisher, *Martes pennanti pacifica* (SC)
- small-footed myotis bat, *Myotis ciliolabrum* (SC)
- long-eared myotis bat, *Myotis evotis* (SC)
- fringed myotis bat, *Myotis thysanodes* (SC)
- long-legged myotis bat, *Myotis volans* (SC)
- Yuma myotis bat, *Myotis yumanensis* (SC)
- Southern grasshopper mouse, *Onychomys torridus ramona* (SC)
- Tulare grasshopper mouse, *Onychomys torridus tularensis* (SC)
- California bighorn sheep, *Ovis canadensis californiana* (SC)
- San Joaquin pocket mouse, *Perognathus inornatus* (SC)
- pale Townsend's big-eared bat, *Plecotus townsendii pallescens* (SC)
- Pacific western big-eared bat, *Plecotus townsendii townsendii* (SC)
- Mt. Lyell shrew, *Sorex lyelli* (SC)
- Sierra Nevada red fox, *Vulpes vulpes necator* (SC)

Birds

- northern goshawk, *Accipiter gentilis* (SC)
- tricolored blackbird, *Agelaius tricolor* (SC)
- western burrowing owl, *Athene cunicularia hypugea* (SC)
- ferruginous hawk, *Buteo regalis* (SC)
- little willow flycatcher, *Empidonax traillii brewsteri* (SC)
- white-faced ibis, *Plegadis chihi* (SC)
- California spotted owl, *Strix occidentalis occidentalis* (SC)

Reptiles

- silvery legless lizard, *Anniella pulchra pulchra* (SC)
- northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
- southwestern pond turtle, *Clemmys marmorata pallida* (SC)
- San Joaquin whipsnake, *Masticophis flagellum ruddocki* (SC)
- California horned lizard, *Phrynosoma coronatum frontale* (SC)

Amphibians

- Yosemite toad, *Bufo canorus* (SC)
- Mount Lyell salamander, *Hydromantes platycephalus* (SC)
- foothill yellow-legged frog, *Rana boylii* (SC)

FRESNO COUNTY

Species of Concern

Amphibians

mountain yellow-legged frog, *Rana muscosa* (SC)

western spadefoot toad, *Scaphiopus hammondii* (SC)

Fish

green sturgeon, *Acipenser medirostris* (SC)

river lamprey, *Lampetra ayresi* (SC)

Kern brook lamprey, *Lampetra hubbsi* (SC)

Pacific lamprey, *Lampetra tridentata* (SC)

longfin smelt, *Spirinchus thaleichthys* (SC)

Invertebrates

Ciervo aegialian scarab beetle, *Aegialia concinna* (SC)

San Joaquin tiger beetle, *Cicindela tranquebarica ssp* (SC)

San Joaquin dune beetle, *Coelus gracilis* (SC)

Kings Canyon cryptochian caddisfly, *Cryptochia excella* (SC)

Wooly hydroporus diving beetle, *Hydroporus diving beetle* (SC)

Hopping's blister beetle, *Lytta hoppingi* (SC)

moestan blister beetle, *Lytta moesta* (SC)

molestan blister beetle, *Lytta molesta* (SC)

Morrison's blister beetle, *Lytta morrisoni* (SC)

Dry Creek cliff strider bug, *Oravelia pege* (SC)

Bohart's blue butterfly, *Philotiella speciosa bohartorum* (SC)

Sierra pygmy grasshopper, *Tetrix sierrana* (SC)

Plants

obovate-leaved thornmint, *Acanthomintha obovata ssp. obovata* (SC)

forked fiddleneck, *Amsinckia vernicosa var. furcata* (SC)

Bodie Hills rock-cress, *Arabis bodiensis* (SC)

Raven's milk-vetch, *Astragalus monoensis var. ravenii* (SC)

heartscale, *Atriplex cordulata* (SC)

brittlescale, *Atriplex depressa* (SC)

Lost Hills saltbush, *Atriplex vallicola* (SC)

South Coast Range morning-glory, *Calystegia collina ssp. venusta* (SC)

Mono Hot Springs evening-primrose, *Camissonia sierrae ssp. alticola* (SC)

San Benito spineflower, *Chorizanthe biloba var. immemora* (SC)

FRESNO COUNTY

Species of Concern

Plants

Fresno County bird's-beak, *Cordylanthus tenuis ssp. barbatus* (SC)
recurved larkspur, *Delphinium recurvatum* (SC)
mouse buckwheat, *Eriogonum nudum var. murinum* (SC)
spiny-sepaled coyote-thistle, *Eryngium spinosepalum* (SC)
hollisteria, *Hollisteria lanata* (SC)
delta tule-pea, *Lathyrus jepsonii var. jepsonii* (SC)
rayless layia, *Layia discoidea* (SC)
Panoche peppergrass, *Lepidium jaredii var. album* (SC)
long-petaled lewisia, *Lewisia longipetala* (SC)
orange lupine, *Lupinus citrinus var. citrinus* (SC)
valley sagittaria, *Sagittaria sanfordii* (SC)
parasol clover, *Trifolium bolanderi* (SC)
lesser saltscale, *Atriplex minuscula* (SC)
pale-yellow layia, *Layia heterotricha* (SC)

KINGS COUNTY

Listed Species

Mammals

giant kangaroo rat, *Dipodomys ingens* (E)
Fresno kangaroo rat, *Dipodomys nitratoides exilis* (E)
Tipton kangaroo rat, *Dipodomys nitratoides nitratoides* (E)
San Joaquin kit fox, *Vulpes macrotis mutica* (E)

Birds

American peregrine falcon, *Falco peregrinus anatum* (E)
California condor, *Gymnogyps californianus* (E)
Aleutian Canada goose, *Branta canadensis leucopareia* (T)
bald eagle, *Haliaeetus leucocephalus* (T)

Reptiles

blunt-nosed leopard lizard, *Gambelia (=Crotaphytus) silus* (E)
giant garter snake, *Thamnophis gigas* (T)

KINGS COUNTY

Listed Species

Amphibians

California red-legged frog, *Rana aurora draytonii* (T)

Fish

delta smelt, *Hypomesus transpacificus* (T)

Invertebrates

vernal pool fairy shrimp, *Branchinecta lynchi* (T)

valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)

Plants

San Joaquin wooly-threads, *Lembertia congdonii* (E)

Hoover's wooly-star, *Eriastrum hooveri* (T)

California jewelflower, *Caulanthus californicus* (E)

Proposed Species

Fish

Sacramento splittail, *Pogonichthys macrolepidotus* (PT)

Candidate Species

Birds

mountain plover, *Charadrius montanus* (C)

Amphibians

California tiger salamander, *Ambystoma californiense* (C)

Species of Concern

Mammals

Nelson's antelope ground squirrel, *Ammospermophilus nelsoni* (SC)

short-nosed kangaroo rat, *Dipodomys nitratoides brevinasus* (SC)

greater western mastiff-bat, *Eumops perotis californicus* (SC)

small-footed myotis bat, *Myotis ciliolabrum* (SC)

long-eared myotis bat, *Myotis evotis* (SC)

fringed myotis bat, *Myotis thysanodes* (SC)

long-legged myotis bat, *Myotis volans* (SC)

KINGS COUNTY

Species of Concern

Mammals

Yuma myotis bat, *Myotis yumanensis* (SC)

Southern grasshopper mouse, *Onychomys torridus ramona* (SC)

Tulare grasshopper mouse, *Onychomys torridus tularensis* (SC)

San Joaquin pocket mouse, *Perognathus inornatus* (SC)

Pacific western big-eared bat, *Plecotus townsendii townsendii* (SC)

Sierra Nevada red fox, *Vulpes vulpes necator* (SC)

Birds

tricolored blackbird, *Agelaius tricolor* (SC)

western burrowing owl, *Athene cunicularia hypugea* (SC)

ferruginous hawk, *Buteo regalis* (SC)

little willow flycatcher, *Empidonax traillii brewsteri* (SC)

white-faced ibis, *Plegadis chihi* (SC)

San Joaquin LeConte's thrasher, *Toxostoma lecontei macmillanorum* (SC)

Reptiles

silvery legless lizard, *Anniella pulchra pulchra* (SC)

northwestern pond turtle, *Clemmys marmorata marmorata* (SC)

southwestern pond turtle, *Clemmys marmorata pallida* (SC)

San Joaquin whipsnake, *Masticophis flagellum ruddocki* (SC)

California horned lizard, *Phrynosoma coronatum frontale* (SC)

Amphibians

foothill yellow-legged frog, *Rana boylii* (SC)

western spadefoot toad, *Scaphiopus hammondii* (SC)

Fish

Kern brook lamprey, *Lampetra hubbsi* (SC)

Invertebrates

Ciervo aegialian scarab beetle, *Aegialia concinna* (SC)

San Joaquin dune beetle, *Coelus gracilis* (SC)

molestan blister beetle, *Lytta molesta* (SC)

Doyen's trigonascuta dune weevil, *Trigonoscuta doyeni* (SC)

KINGS COUNTY

Species of Concern

Plants

- forked fiddleneck, *Amsinckia vernicosa var. furcata* (SC)
- heartscale, *Atriplex cordulata* (SC)
- Lost Hills saltbush, *Atriplex vallicola* (SC)
- slough thistle, *Cirsium crassicaule* (SC)
- recurved larkspur, *Delphinium recurvatum* (SC)
- pale-yellow layia, *Layia heterotricha* (SC)

KEY:

(E)	*Endangered*	Listed (in the Federal Register) as being in danger of extinction.
(T)	*Threatened*	Listed as likely to become endangered within the foreseeable future.
(P)	*Proposed*	Officially proposed (in the Federal Register) for listing as endangered or threatened.
(C)	*Candidate*	Candidate to become a *proposed* species.
(SC)	*Species of Concern*	May be endangered or threatened. Not enough biological information has been gathered to support listing at this time.
(*)	Possibly extinct.	
	Critical Habitat	Area essential to the conservation of a species.

Enclosure B

FEDERAL AGENCIES' RESPONSIBILITIES UNDER SECTIONS 7(a) and (c) OF THE ENDANGERED SPECIES ACT

SECTION 7(a) Consultation/Conference

Requires: (1) federal agencies to utilize their authorities to carry out programs to conserve endangered and threatened species; (2) Consultation with FWS when a federal action may affect a listed endangered or threatened species to insure that any action authorized, funded, or carried out by a federal agency is not likely to jeopardize the continued existence of listed species or result in the destruction or adverse modification of critical habitat. The process is initiated by the federal agency after determining the action may affect a listed species; and (3) Conference with FWS when a Federal action is likely to jeopardize the continued existence of a proposed species or result in destruction or adverse modification of proposed critical habitat.

SECTION 7(c) Biological Assessment-Major Construction Activity[1]

Requires federal agencies or their designees to prepare a Biological Assessment (BA) for major construction activities. The BA analyzes the effects of the action[2] on listed and proposed species. The process begins with a Federal agency requesting from FWS a list of proposed and listed threatened and endangered species. The BA should be completed within 180 days after its initiation (or within such a time period as is mutually agreeable). If the BA is not initiated within 90 days of receipt of the list, the accuracy of the species list should be informally verified with our Service. No irreversible commitment of resources is to be made during the BA process which would foreclose reasonable and prudent alternatives to protect endangered species. Planning, design, and administrative actions may proceed; however, no construction may begin.

We recommend the following for inclusion in the BA: an on-site inspection of the area affected by the proposal which may include a detailed survey of the area to determine if the species or suitable habitat is present; a review of literature and scientific data to determine species' distribution, habitat needs, and other biological requirement; interviews with experts, including those within FWS, State conservation departments, universities and others who may have data not yet published in scientific literature; an analysis of the effects of the proposal on the species in terms of individuals and populations, including consideration of indirect effects of the proposal on the species and its habitat; an analysis of alternative actions considered. The BA should document the results, including a discussion of study methods used, and problems encountered, and other relevant information. The BA should conclude whether or not a listed or proposed species will be affected. Upon completion, the BA should be forwarded to our office.

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[1]A construction project (or other undertaking having similar physical impacts) which is a major federal action significantly affecting the quality of the human environment as referred to in NEPA (42 U.S.C. 4332(2)C).

[2]"Effects of the action" refers to the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action.

Enclosure C

Guidelines For Conducting And Reporting Botanical Inventories For Federally Listed, Proposed And Candidate Plants

(September 23, 1996)

These guidelines describe protocols for conducting botanical inventories for federally listed, proposed and candidate plants, and describe minimum standards for reporting results. The Service will use, in part, the information outlined below in determining whether the project under consideration may affect any listed, proposed or candidate plants, and in determining the direct, indirect, and cumulative effects.

Field inventories should be conducted in a manner that will locate listed, proposed, or candidate species (target species) that may be present. The entire project area requires a botanical inventory, except developed agricultural lands. The field investigator(s) should:

1. Conduct inventories at the appropriate times of year when target species are present and identifiable. Inventories will include all potential habitats. Multiple site visits during a field season may be necessary to make observations during the appropriate phenological stage of all target species.

2. If available, use a regional or local reference population to obtain a visual image of the target species and associated habitat(s). If access to reference populations(s) is not available, investigators should study specimens from local herbaria.

3. List every species observed and compile a comprehensive list of vascular plants for the entire project site. Vascular plants need to be identified to a taxonomic level which allows rarity to be determined.

4. Report results of botanical field inventories that include:

    a. a description of the biological setting, including plant community, topography, soils, potential habitat of target species, and an evaluation of environmental conditions, such as timing or quantity of rainfall, which may influence the performance and expression of target species

    b. a map of project location showing scale, orientation, project boundaries, parcel size, and map quadrangle name

    c. survey dates and survey methodology(ies)

    d. if a reference population is available, provide a written narrative describing the target species reference population(s) used, and date(s) when observations were made

    e. a comprehensive list of all vascular plants occurring on the project site for each habitat type

    f. current and historic land uses of the habitat(s) and degree of site alteration

    g. presence of target species off-site on adjacent parcels, if known

    h. an assessment of the biological significance or ecological quality of the project site in a local and regional context

5. If target species is(are) found, report results that additionally include:

a. a map showing federally listed, proposed and candidate species distribution as they relate to the proposed project

b. if target species is (are) associated with wetlands, a description of the direction and integrity of flow of surface hydrology. If target species is (are) affected by adjacent off-site hydrological influences, describe these factors.

c. the target species phenology and microhabitat, an estimate of the number of individuals of each target species per unit area; identify areas of high, medium and low density of target species over the project site, and provide acres of occupied habitat of target species. Investigators could provide color slides, photos or color copies of photos of target species or representative habitats to support information or descriptions contained in reports.

d. the degree of impact(s), if any, of the proposed project as it relates to the potential unoccupied habitat of target habitat.

6. Document findings of target species by completing California Native Species Field Survey Form(s) and submit form(s) to the Natural Diversity Data Base. Documentation of determinations and/or voucher specimens may be useful in cases of taxonomic ambiguities, habitat or range extensions.

7. Report as an addendum to the original survey, any change in abundance and distribution of target plants in subsequent years. Project sites with inventories older than 3 years from the current date of project proposal submission will likely need additional survey. Investigators need to assess whether an additional survey(s) is (are) needed.

8. Adverse conditions may prevent investigator(s) from determining presence or identifying some target species in potential habitat(s) of target species. Disease, drought, predation, or herbivory may preclude the presence or identification of target species in any year. An additional botanical inventory(ies) in a subsequent year(s) may be required if adverse conditions occur in a potential habitat(s). Investigator(s) may need to discuss such conditions.

9. Guidance from California Department of Fish and Game (CDFG) regarding plant and plant community surveys can be found in Guidelines for Assessing the Effects of Proposed Developments on Rare and Endangered Plants and Plant Communities, 1984. Please contact the CDFG Regional Office for questions regarding the CDFG guidelines and for assistance in determining any applicable State regulatory requirements.

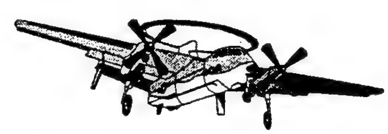
United States Department of the Interior

FISH AND WILDLIFE SERVICE
Ecological Services
Carlsbad Field Office
2730 Loker Avenue West
Carlsbad, California 92008

NAF El Centro
Listed Endangered, Threatened,
and Sensitive Species

Common Name	Scientific Name	Status
<u>Listed Species</u>		
<u>BIRDS</u>		
peregrine falcon	<u>Falco peregrinus</u>	E
southwestern willow flycatcher	<u>Empidonax traillii extimus</u>	E
<u>FISH</u>		
desert pupfish	<u>Cyprinodon macularius</u>	E
<u>Proposed Species</u>		
<u>PLANTS</u>		
Peirson's milkvetch	<u>Astragalus magdalenae</u> var. <u>peirsonii</u>	PE

E: Endangered
T: Threatened
PE: Proposed Endangered
PT: Proposed Threatened
C: Candidate for listing



Appendix C. Socioeconomics

C. SOCIOECONOMCS C-1

Attachments

APPENDIX C
SOCIOECONOMICS

C.1 OVERVIEW

The assessment of socioeconomic impacts resulting from Navy actions can be one of the most controversial issues related to the realignment, closure or modification of an installation. The economic and social well-being of a community can be dependent upon the activities of the installation, and disruptions to the status quo become politically charged and emotion-laden. The objective of a socioeconomic analysis of Navy actions is an open, realistic, and documented assessment of the potential effects.

The requirement to assess socioeconomic impacts in EAs or EISs has been a source of legal discussion since the passage of the National Environmental Policy Act (NEPA). While NEPA is predominately oriented toward the biophysical environment, court decisions have supported the need for analysis of socioeconomic impacts when they are accompanied by biophysical impacts.

C.2 ECONOMIC IMPACT FORECAST SYSTEM (EIFS)

The US Army developed the Economic Impact Forecast System (EIFS) with the assistance of many academic and professional economists and regional scientists to address economic impacts and to measure their significance. As a result of its applicability and in the interest of uniformity, EIFS is mandated by ASA (IL&E) for use in NEPA assessment for base realignments and closure. The entire system is designed for the scrutiny of a populace affected by the actions being studied. The algorithms in EIFS are simple and easy to understand but still have firm, defensible bases in regional economic theory.

EIFS is included as one of the tools of the Environmental Technical Information System (ETIS) and is implemented as an on-line service supported by USACERL through the University of Illinois. The system is available to anyone with an

approved login and password and is available at all times through toll-free numbers, Telnet, and other commonly-used communications. The ETIS Support Center at the university and the staff of USACERL are available to assist with the use of EIFS.

The data bases in EIFS are national in scope and cover the approximately 3,700 counties, parishes and independent cities recognized by federal agencies as reporting units. EIFS allows the user to define an economic region of influence (ROI) by simply identifying the counties that are to be analyzed. Once the ROI is defined, the system aggregates the data, calculates multipliers and other variables used in the various models in EIFS, and prompts the user for input data.

C.3 THE EIFS IMPACT MODELS

The basis of the EIFS analytical capabilities is the calculation of multipliers that are used to estimate the impacts resulting from Navy-related changes in local expenditures and/or employment. In calculating the multipliers, EIFS uses the economic base model approach that relies on the ratio of total economic activity to basic economic activity. Basic, in this context, is defined as the production or employment to supply goods and services outside the ROI or by federal activities (such as military installations and their employees). According to economic base theory, the ratio of total income to basic income is measurable (as the multiplier) and sufficiently stable so that future changes in economic activity can be forecast. This technique is especially appropriate for estimating aggregate impacts and makes the economic base model ideal for the EA/EIS process.

The multiplier is interpreted as the total impact on the economy of the region resulting from a unit change in its basic sector for example, a dollar increase in local expenditures due to an expansion of its military installation. EIFS estimates its multipliers using a location quotient approach based on the concentration of industries within the region relative to the concentration of industries in the nation.

EIFS has models for three basic military activity scenarios: standard, construction, and training. The user selects a model to be used and inputs those data elements into the selected model that describe the Army action: civilian and military to be moved and their salaries and the local procurement associated with the activity being relocated. Once these are entered into the system, a projection of changes in the local economy is provided. These are projected changes in sales volume, employment, income, and population. These four indicator variables are used to measure and evaluate socioeconomic impacts.

C.4 THE EVALUATION OF SOCIOECONOMIC IMPACTS

Under NEPA, there are no established thresholds in determining whether a socioeconomic impact is significant or not. Once model projections are obtained, the Rational Threshold Value (RTV) profile allows the reader to evaluate the context and

intensity of the impacts. This analytical tool reviews the historical trends for the defined region and develops measures of local historical fluctuations in sales volume, employment, income, and population. These evaluations indicate the intensity of the positive and negative changes of a project.

The RTV provides boundaries (threshold values) to assess the magnitude of an action's impacts. The largest historical change (both increase and decrease) maps out the boundaries. These values provide a basis for comparing an action's impact to the historical fluctuation in a particular area. Therefore, the assignment of thresholds is made on an individual basis. Specifically, EIFS sets the boundaries by multiplying the maximum historical deviation of:

		Increase	Decrease
Business volume	x	100%	75%
Personal income	x	100%	67%
Total employment	x	100%	67%
Total population	x	100%	50%

The percentage allowances are arbitrary but sensible. The maximum positive historical fluctuation is expressed with expansion because of the positive connotations of economic growth. While cases of damaging economic growth have been cited and although the zero-growth concept is being accepted by many local planning groups, the effects of reductions and closures generally are much more controversial than expansions.

The major strengths of the RTV criteria is that it is specific to the region under analysis and it is based on actual historical time series data for the defined region. The use of EIFS impact models in combination with the RTV has proven very successful in addressing perceived socioeconomic impacts. The EIFS model and the RTV technique for measuring significance are theoretically sound and have been reviewed on numerous occasions.

The severity of conceivable impacts accelerates in the following order: total business volume, total personal income, total employment, and total population. Business volume impacts may be alleviated by manipulation of such variables as inventory and new equipment. Impacts on workers or proprietors are not easily or immediately assessed. Changes in employment and income are of primary interest. Employment and income impacts are followed by changes in personal income, directly affecting individuals within the region. Population threshold indicators are extremely important because they reflect the effects on local government revenues, housing, education, infrastructure, and other social services. They should be weighted accordingly.

The following pages contain the EIFS input and output data for the proposed realignment action. This data forms the basis for the socioeconomic impact analysis presented in Section 4.4.

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EIFS Model Results for NAWS Point Mugu

December 17, 1997

MEMORANDUM

From: Command Master Chief, Commander Air Early Warning Wing Pacific
To: All Concerned

Subj: PROJECTED SCHOOL LOADING FOR VENTURA COUNTY AREA SCHOOLS FROM THE AIR EARLY WARNING WING MOVE TO NAWC PT MUGU.

1. A survey was taken of available personal. The results are listed below. The USN is constantly transferring and receiving new personnel. Therefore, about 60 percent of the people going to PT Mugu were surveyod and a 40 percent addition was added. VAW 112 is deployed to the Persian Gulf and unable to take the surveys. The average is 28 children per squadron and that figure has been added to the total for VAW 112.

	112	113	116	117	STAFF	
		26	17	18	2	
		x.40	x.40	x.40	x.40	
		10.4	6.8	7.2	1	
Total:	28	36	24	25	3	= 116
By Class:						
K		2	4	3	1	
1		6	3	3		
2		2	1			
3		3	1	1		
4		1		2		
5		4	3	1		
6			1	1		
7		3	3	2	1	
8		3		1		
9				2		
10				1		
11		1	1			
12		1		1		
Arrival Date:	Aug. 1998	Nov. 1998	July 1998	May 1999	July 1998	

NAMTRADET will start their move OCT. 1999 and finish Jan 2000. It is to early for them to determine school loading.

Aircraft Intermediate Maintenance Detachment will start a phased move in July 1998. Only 13 personnel will arrive in July of 1998.

V/R Paul H Harlacher

Paul H Harlacher
ENCM(SW) USN

RATIONAL THRESHOLD VALUES
NAWS Mugu
Ventura County

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

POPULATION

YEAR	Population	change	deviation	%deviation
1969	369,800			
1970	381,200	11,400	-2,374	-0.642 %
1971	395,700	14,500	726	0.190 %
1972	408,500	12,800	-974	-0.246 %
1973	419,500	11,000	-2,774	-0.679 %
1974	433,900	14,400	626	0.149 %
1975	448,900	15,000	1,226	0.283 %
1976	460,500	11,600	-2,174	-0.484 %
1977	478,700	18,200	4,426	0.961 %
1978	494,100	15,400	1,626	0.340 %
1979	512,200	18,100	4,326	0.876 %
1980	532,700	20,500	6,726	1.313 %
1981	544,700	12,000	-1,774	-0.333 %
1982	559,100	14,400	626	0.115 %
1983	571,500	12,400	-1,374	-0.246 %
1984	583,200	11,700	-2,074	-0.363 %
1985	595,600	12,400	-1,374	-0.236 %
1986	606,700	11,100	-2,674	-0.449 %
1987	621,600	14,900	1,126	0.186 %
1988	638,500	16,900	3,126	0.503 %
1989	656,300	17,800	4,026	0.631 %
1990	670,200	13,900	126	0.019 %
1991	676,800	6,600	-7,174	-1.070 %
1992	686,600	9,800	-3,974	-0.587 %

average yearly change:	13,774
maximum historic positive deviation:	6,726
maximum historic negative deviation:	-7,174
maximum historic % positive deviation:	1.313 %
maximum historic % negative deviation:	-1.070 %
positive rtv:	1.313 %
negative rtv:	-0.535 %

RATIONAL THRESHOLD VALUES
NAWS Mugu
Ventura County

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

EMPLOYMENT

YEAR	Employment	change	deviation	%deviation
1969	133,463			
1970	134,567	1,104	-7,556	-5.661 %
1971	139,190	4,623	-4,037	-3.000 %
1972	146,582	7,392	-1,268	-0.911 %
1973	154,660	8,078	-582	-0.397 %
1974	163,615	8,955	295	0.191 %
1975	170,741	7,126	-1,534	-0.938 %
1976	175,312	4,571	-4,089	-2.395 %
1977	187,231	11,919	3,259	1.859 %
1978	202,251	15,020	6,360	3.397 %
1979	212,431	10,180	1,520	0.752 %
1980	219,778	7,347	-1,313	-0.618 %
1981	225,242	5,464	-3,196	-1.454 %
1982	230,219	4,977	-3,683	-1.635 %
1983	236,821	6,602	-2,058	-0.894 %
1984	249,289	12,468	3,808	1.608 %
1985	261,866	12,577	3,917	1.571 %
1986	272,055	10,189	1,529	0.584 %
1987	287,856	15,801	7,141	2.625 %
1988	306,656	18,800	10,140	3.523 %
1989	319,790	13,134	4,474	1.459 %
1990	331,203	11,413	2,753	0.861 %
1991	330,242	-961	-9,621	-2.905 %
1992	332,643	2,401	-6,259	-1.895 %

average yearly change:	8,660
maximum historic positive deviation:	10,140
maximum historic negative deviation:	-9,621
maximum historic % positive deviation:	3.523 %
maximum historic % negative deviation:	-5.661 %
positive rtv:	3.523 %
negative rtv:	-3.793 %

RATIONAL THRESHOLD VALUES
NAWS Mugu
Ventura County

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

BUSINESS VOLUME (using Non-Farm Income)

YEAR	Non-Farm income	adjusted income	change	deviation	%deviation
1969	853,779	2,525,973			
1970	913,116	2,550,603	24,630	-167,905	-6.647 %
1971	988,400	2,649,866	99,263	-93,273	-3.657 %
1972	1,108,447	2,871,624	221,758	29,223	1.103 %
1973	1,233,495	3,008,524	136,900	-55,635	-1.937 %
1974	1,377,577	3,027,642	19,117	-173,418	-5.764 %
1975	1,549,243	3,117,189	89,547	-102,988	-3.402 %
1976	1,743,797	3,321,518	204,329	11,794	0.378 %
1977	2,002,540	3,582,361	260,843	68,308	2.057 %
1978	2,339,127	3,885,593	303,232	110,696	3.090 %
1979	2,644,495	3,947,007	61,414	-131,121	-3.375 %
1980	2,967,470	3,899,435	-47,572	-240,108	-6.083 %
1981	3,303,070	3,936,913	37,478	-155,057	-3.976 %
1982	3,596,347	4,045,385	108,472	-84,064	-2.135 %
1983	3,942,445	4,303,979	258,595	66,059	1.633 %
1984	4,459,672	4,704,295	400,316	207,780	4.828 %
1985	4,966,013	5,062,195	357,900	165,364	3.515 %
1986	5,477,171	5,675,825	613,630	421,095	8.318 %
1987	6,064,003	6,064,003	388,178	195,643	3.447 %
1988	6,689,648	6,432,354	368,351	175,815	2.899 %
1989	7,205,970	6,610,982	178,628	-13,908	-0.216 %
1990	7,842,241	6,837,176	226,195	33,659	0.509 %
1991	8,094,928	6,779,672	-57,505	-250,040	-3.657 %
1992	8,539,865	6,954,287	174,616	-17,920	-0.264 %

average yearly change:	192,535
maximum historic positive deviation:	421,095
maximum historic negative deviation:	-250,040
maximum historic % positive deviation:	8.318 %
maximum historic % negative deviation:	-6.647 %
positive rtv:	8.318 %
negative rtv:	-4.985 %

RATIONAL THRESHOLD VALUES
NAWS Mugu
Ventura County

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

PERSONAL INCOME

YEAR	Personal income	adjusted income	change	deviation	%deviation
1969	1,491,347	4,412,269			
1970	1,586,044	4,430,291	18,021	-324,357	-7.351 %
1971	1,738,986	4,662,161	231,870	-110,508	-2.494 %
1972	1,955,590	5,066,296	404,135	61,756	1.325 %
1973	2,233,422	5,447,371	381,075	38,697	0.764 %
1974	2,552,139	5,609,097	161,726	-180,653	-3.316 %
1975	2,888,480	5,811,831	202,734	-139,644	-2.490 %
1976	3,252,695	6,195,610	383,779	41,400	0.712 %
1977	3,763,253	6,732,116	536,507	194,128	3.133 %
1978	4,480,083	7,441,998	709,882	367,504	5.459 %
1979	5,103,432	7,617,063	175,064	-167,314	-2.248 %
1980	5,930,896	7,793,556	176,493	-165,885	-2.178 %
1981	6,741,670	8,035,363	241,807	-100,571	-1.290 %
1982	7,313,754	8,226,945	191,581	-150,797	-1.877 %
1983	7,880,304	8,602,952	376,007	33,629	0.409 %
1984	8,782,074	9,263,791	660,839	318,460	3.702 %
1985	9,574,866	9,760,312	496,521	154,143	1.664 %
1986	10,487,590	10,867,969	1,107,657	765,278	7.841 %
1987	11,398,630	11,398,630	530,661	188,283	1.732 %
1988	12,356,717	11,881,459	482,829	140,450	1.232 %
1989	13,279,914	12,183,407	301,949	-40,430	-0.340 %
1990	14,162,477	12,347,408	164,001	-178,378	-1.464 %
1991	14,450,673	12,102,741	-244,667	-587,046	-4.754 %
1992	15,088,406	12,286,975	184,234	-158,144	-1.307 %

average yearly change:	342,379
maximum historic positive deviation:	765,278
maximum historic negative deviation:	-587,046
maximum historic % positive deviation:	7.841 %
maximum historic % negative deviation:	-7.351 %
positive rtv:	7.841 %
negative rtv:	-4.925 %

STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAWS Point Mugu (1998)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $700,150 (Annual procurement of $1,400,300 for a half year)
Change in expenditures for local services and supplies: $445,380.75 (calculated)

Change in civilian employment: 12 (Half the 48 civilian personnel for half a year, assuming immediate ramp-up in July 1998)
Average income of affected civilian personnel: $37,932
Percent expected to relocate: (0.0) 83.3 percent (20 are assumed to relocate; the other 4 would be hired at the local economy level)

Change in military employment: 237 (Half of the 948 military personnel for half a year, assuming immediate ramp-up in July 1998)
Average income of affected military personnel: $27,331
Percent of military living on the base: 33.0 percent (The unaccompanied personnel who are assumed to live in BOQ/BEQ)

STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAWS Point Mugu (1998)

Export income multiplier:		2.7482	
Change in local			
Sales volume	Direct:	$3,265,000	
	Induced:	$5,708,000	
	Total:	$8,973,000	(0.053%)
Employment	Direct:	21	
	Total:	306	(0.106%)
Income	Direct:	$406,000	
	Total (place of work):	$8,048,000	
	Total (place of residence):	$8,048,000	(0.056%)
Local population ....:		619	(0.100%)
Local off-base population ....:		425	
Number of school children ....:		104	
Demand for housing	Rental:	105	
	Owner occupied:	64	
Government expenditures...........:		$779,000	
Government revenues ....:		$1,027,000	
Net Government revenues ....:		$248,000	
Civilian employees expected to relocate:		10	
Military employees expected to relocate:		237	

STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAWS Point Mugu (1999)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $1,400,300
Change in expenditures for local services and supplies: $890,761.50 (calculated)

Change in civilian employment: 48 (Assuming immediate ramp-up of remaining E-2 personnel in January 1999)
Average income of affected civilian personnel: $37,932
Percent expected to relocate: (0.0) 83.3 percent (20 are assumed to relocate; the other 4 would be hired at the local economy level

Change in military employment: 948 (Assuming immediate ramp-up of remaining E-2 personnel in January 1999)
Average income of affected military personnel: $27,331
Percent of military living on the base: 33.0 percent

STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAWS Point Mugu (1999)

Export income multiplier:	2.7482	
Change in local		
Sales volume .... Direct:	$12,170,000	
Induced:	$21,275,000	
Total:	$33,445,000	(0.197%)
Employment .... Direct:	78	
Total:	1,210	(0.420%)
Income .... Direct:	$1,512,000	
Total (place of work):	$31,886,000	
Total (place of residence):	$31,886,000	(0.221%)
Local population ....:	2,478	(0.399%)
Local off-base population ....:	1,699	
Number of school children ....:	417	
Demand for housing .... Rental:	420	
Owner occupied:	255	
Government expenditures............:	$3,090,000	
Government revenues ....:	$4,085,000	
Net Government revenues ....:	$996,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	948	

STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAWS Mugu (2000)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $1,400,300
Change in expenditures for local services and supplies: $890,761.50 (calculated)

Change in civilian employment: 48
Average income of affected civilian personnel: $37,932
Percent expected to relocate: (0.0) 83.3 percent

Change in military employment: 948
Average income of affected military personnel: $27,331
Percent of military living on the base: 33.0 percent

STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAWS Mugu (2000)

Export income multiplier:	2.7482	
Change in local		
Sales volume .... Direct:	$12,170,000	
Induced:	$21,275,000	
Total:	$33,445,000	(0.197%)
Employment .... Direct:	78	
Total:	1,210	(0.420%)
Income .... Direct:	$1,512,000	
Total (place of work):	$31,886,000	
Total (place of residence):	$31,886,000	(0.221%)
Local population ....:	2,478	(0.399%)
Local off-base population ....:	1,699	
Number of school children ....:	417	
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Government expenditures............:	$3,090,000	
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STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAWS Point Mugu (2001)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $1,400,300
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STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAWS Point Mugu (2001)

Export income multiplier:		2.7482	
Change in local			
Sales volume	Direct:	$12,170,000	
	Induced:	$21,275,000	
	Total:	$33,445,000	(0.197%)
Employment	Direct:	78	
	Total:	1,210	(0.420%)
Income	Direct:	$1,512,000	
	Total (place of work):	$31,886,000	
	Total (place of residence):	$31,886,000	(0.221%)
Local population ....:		2,478	(0.399%)
Local off-base population ....:		1,699	
Number of school children ....:		417	
Demand for housing	Rental:	420	
	Owner occupied:	255	
Government expenditures............:		$3,090,000	
Government revenues ....:		$4,085,000	
Net Government revenues ....:		$996,000	
Civilian employees expected to relocate:		40	
Military employees expected to relocate:		948	

CONSTRUCTION

Project name: E-2 Realignment to NAWS Point Mugu (1998)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $10,156,000
Local expenditures of project: $6,460,453.90 (calculated)
Percent for labor: (34.2)
Percent for materials: (57.8)
Percent allowed for other: 8.00 (calculated)
Percent of construction workers expected to migrate into the area: (30.0)

CONSTRUCTION IMPACT FORECAST FOR E-2 Realignment to NAWS Point Mugu (1998)

Export income multiplier:	2.7482	
Change in local		
Sales volume .... Direct:	$5,511,000	
Induced:	$9,633,000	
Total:	$15,144,000	(0.087%)
Employment .... Direct:	34	
Total:	161	(0.056%)
Income .... Direct:	$670,000	
Total (place of work):	$4,203,000	
Total (place of residence):	$4,203,000	(0.029%)
Local population ....:	45	(0.007%)
Local off-base population ....:	45	
Number of school children ....:	8	
Demand for housing .... Rental:	20	
Owner occupied:	0	
Government expenditures............:	$324,000	
Government revenues ....:	$338,000	
Net Government revenues ....:	$13,000	
Civilian employees expected to relocate:	20	
Military employees expected to relocate:	0	

CONSTRUCTION

Project name: E-2 Realignment to NAWS Point Mugu (1999)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $15,696,000
Local expenditures of project: $9,984,569.17 (calculated)
Percent for labor: (34.2)
Percent for materials: (57.8)
Percent allowed for other: 8.00 (calculated)
Percent of construction workers expected to migrate into the area: (30.0)

CONSTRUCTION IMPACT FORECAST FOR E-2 Realignment to NAWS Point Mugu (1999)

Export income multiplier:	2.7482	
Change in local		
Sales volume .... Direct:	$8,517,000	
Induced:	$14,888,000	
Total:	$23,405,000	(0.135%)
Employment .... Direct:	53	
Total:	249	(0.086%)
Income .... Direct:	$1,036,000	
Total (place of work):	$6,496,000	
Total (place of residence):	$6,496,000	(0.045%)
Local population ....:	70	(0.011%)
Local off-base population ....:	70	
Number of school children ....:	12	
Demand for housing .... Rental:	31	
Owner occupied:	0	
Government expenditures............:	$501,000	
Government revenues ....:	$522,000	
Net Government revenues ....:	$20,000	
Civilian employees expected to relocate:	31	
Military employees expected to relocate:	0	

CONSTRUCTION

Project name: E-2 Realignment to NAWS Point Mugu (2000)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $2,770,000
Local expenditures of project: $1,762,057.63 (calculated)
Percent for labor: (34.2)
Percent for materials: (57.8)
Percent allowed for other: 8.00 (calculated)
Percent of construction workers expected to migrate into the area: (30.0)

CONSTRUCTION IMPACT FORECAST FOR E-2 Realignment to NAWS Point Mugu (2000)

Export income multiplier:	2.7482	
Change in local		
Sales volume .... Direct:	$1,503,000	
Induced:	$2,627,000	
Total:	$4,130,000	(0.024%)
Employment .... Direct:	9	
Total:	44	(0.015%)
Income .... Direct:	$183,000	
Total (place of work):	$1,146,000	
Total (place of residence):	$1,146,000	(0.008%)
Local population ....:	12	(0.002%)
Local off-base population ....:	12	
Number of school children ....:	2	
Demand for housing .... Rental:	5	
Owner occupied:	0	
Government expenditures............:	$88,000	
Government revenues ....:	$92,000	
Net Government revenues ....:	$4,000	
Civilian employees expected to relocate:	5	
Military employees expected to relocate:	0	

EIFS Model Results for NAS Lemoore

RATIONAL THRESHOLD VALUES
NAS Lemoore
Kings and Fresno Counties (aggregated)

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

POPULATION

YEAR	Population	change	deviation	%deviation
1969	473,900			
1970	481,500	7,600	-7,143	-1.507 %
1971	491,200	9,700	-5,043	-1.047 %
1972	500,100	8,900	-5,843	-1.190 %
1973	508,200	8,100	-6,643	-1.328 %
1974	519,000	10,800	-3,943	-0.776 %
1975	534,800	15,800	1,057	0.204 %
1976	548,900	14,100	-643	-0.120 %
1977	561,500	12,600	-2,143	-0.391 %
1978	571,200	9,700	-5,043	-0.898 %
1979	579,900	8,700	-6,043	-1.058 %
1980	591,500	11,600	-3,143	-0.542 %
1981	606,100	14,600	-143	-0.024 %
1982	622,100	16,000	1,257	0.207 %
1983	640,400	18,300	3,557	0.572 %
1984	659,100	18,700	3,957	0.618 %
1985	674,600	15,500	757	0.115 %
1986	686,600	12,000	-2,743	-0.407 %
1987	705,100	18,500	3,757	0.547 %
1988	730,500	25,400	10,657	1.511 %
1989	752,700	22,200	7,457	1.021 %
1990	773,700	21,000	6,257	0.831 %
1991	795,000	21,300	6,557	0.847 %
1992	813,000	18,000	3,257	0.410 %

average yearly change:	14,743
maximum historic positive deviation:	10,657
maximum historic negative deviation:	-7,143
maximum historic % positive deviation:	1.511 %
maximum historic % negative deviation:	-1.507 %
positive rtv:	1.511 %
negative rtv:	-0.754 %

RATIONAL THRESHOLD VALUES
NAS Lemoore
Kings and Fresno Counties (aggregated)

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

EMPLOYMENT

YEAR	Employment	change	deviation	%deviation
1969	202,756			
1970	207,326	4,570	-3,482	-1.717 %
1971	213,273	5,947	-2,105	-1.015 %
1972	225,804	12,531	4,479	2.100 %
1973	235,285	9,481	1,429	0.633 %
1974	246,823	11,538	3,486	1.482 %
1975	253,391	6,568	-1,484	-0.601 %
1976	261,720	8,329	277	0.110 %
1977	270,839	9,119	1,067	0.408 %
1978	282,692	11,853	3,801	1.404 %
1979	301,522	18,830	10,778	3.813 %
1980	308,427	6,905	-1,147	-0.380 %
1981	311,674	3,247	-4,805	-1.558 %
1982	313,260	1,586	-6,466	-2.074 %
1983	321,133	7,873	-179	-0.057 %
1984	328,264	7,131	-921	-0.287 %
1985	331,832	3,568	-4,484	-1.366 %
1986	334,838	3,006	-5,046	-1.521 %
1987	346,463	11,625	3,573	1.067 %
1988	361,091	14,628	6,576	1.898 %
1989	372,667	11,576	3,524	0.976 %
1990	386,894	14,227	6,175	1.657 %
1991	389,311	2,417	-5,635	-1.456 %
1992	387,941	-1,370	-9,422	-2.420 %

average yearly change:	8,052
maximum historic positive deviation:	10,778
maximum historic negative deviation:	-9,422
maximum historic % positive deviation:	3.813 %
maximum historic % negative deviation:	-2.420 %
positive rtv:	3.813 %
negative rtv:	-1.621 %

RATIONAL THRESHOLD VALUES
NAS Lemoore
Kings and Fresno Counties (aggregated)

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

BUSINESS VOLUME (using Non-Farm Income)

YEAR	Non-Farm income	adjusted income	change	deviation	%deviation
1969	1,117,431	3,306,009			
1970	1,205,517	3,367,366	61,357	-95,374	-2.885 %
1971	1,322,519	3,545,627	178,261	21,530	0.639 %
1972	1,486,422	3,850,834	305,207	148,476	4.188 %
1973	1,676,472	4,088,956	238,122	81,390	2.114 %
1974	1,880,283	4,132,490	43,534	-113,197	-2.768 %
1975	2,084,751	4,194,670	62,180	-94,552	-2.288 %
1976	2,354,448	4,484,663	289,993	133,261	3.177 %
1977	2,631,046	4,706,701	222,038	65,307	1.456 %
1978	3,008,945	4,998,247	291,546	134,815	2.864 %
1979	3,464,338	5,170,654	172,406	15,675	0.314 %
1980	3,777,357	4,963,676	-206,978	-363,710	-7.034 %
1981	4,052,859	4,830,583	-133,093	-289,824	-5.839 %
1982	4,197,224	4,721,287	-109,296	-266,027	-5.507 %
1983	4,511,902	4,925,657	204,371	47,639	1.009 %
1984	4,916,035	5,185,691	260,033	103,302	2.097 %
1985	5,215,622	5,316,638	130,947	-25,784	-0.497 %
1986	5,521,963	5,722,241	405,603	248,872	4.681 %
1987	6,033,555	6,033,555	311,314	154,582	2.701 %
1988	6,492,620	6,242,904	209,349	52,617	0.872 %
1989	7,112,777	6,525,483	282,580	125,848	2.016 %
1990	7,835,348	6,831,167	305,683	148,952	2.283 %
1991	8,212,027	6,877,744	46,578	-110,154	-1.613 %
1992	8,486,501	6,910,831	33,087	-123,645	-1.798 %

average yearly change:	156,731
maximum historic positive deviation:	248,872
maximum historic negative deviation:	-363,710
maximum historic % positive deviation:	4.681 %
maximum historic % negative deviation:	-7.034 %
positive rtv:	4.681 %
negative rtv:	-5.276 %

RATIONAL THRESHOLD VALUES
NAS Lemoore
Kings and Fresno Counties (aggregated)

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

PERSONAL INCOME

YEAR	Personal income	adjusted income	change	deviation	%deviation
1969	1,668,472	4,936,308			
1970	1,834,571	5,124,500	188,192	-63,443	-1.285 %
1971	1,979,113	5,305,933	181,433	-70,203	-1.370 %
1972	2,223,148	5,759,451	453,518	201,882	3.805 %
1973	2,545,547	6,208,651	449,200	197,565	3.430 %
1974	3,040,132	6,681,609	472,958	221,322	3.565 %
1975	3,233,169	6,505,370	-176,239	-427,874	-6.404 %
1976	3,785,360	7,210,210	704,839	453,204	6.967 %
1977	4,005,609	7,165,669	-44,541	-296,176	-4.108 %
1978	4,399,184	7,307,615	141,946	-109,690	-1.531 %
1979	5,352,613	7,988,975	681,360	429,725	5.881 %
1980	6,265,749	8,233,573	244,598	-7,037	-0.088 %
1981	6,429,576	7,663,380	-570,193	-821,829	-9.981 %
1982	6,749,976	7,592,774	-70,606	-322,242	-4.205 %
1983	6,887,462	7,519,063	-73,710	-325,346	-4.285 %
1984	7,736,451	8,160,813	641,750	390,114	5.188 %
1985	8,292,046	8,452,646	291,833	40,198	0.493 %
1986	8,800,766	9,119,965	667,318	415,683	4.918 %
1987	9,642,581	9,642,581	522,616	270,981	2.971 %
1988	10,211,036	9,818,304	175,723	-75,913	-0.787 %
1989	11,163,668	10,241,897	423,593	171,958	1.751 %
1990	12,150,402	10,593,202	351,304	99,669	0.973 %
1991	12,457,405	10,433,337	-159,864	-411,500	-3.885 %
1992	13,168,980	10,723,925	290,587	38,952	0.373 %

average yearly change:	251,636
maximum historic positive deviation:	453,204
maximum historic negative deviation:	-821,829
maximum historic % positive deviation:	6.967 %
maximum historic % negative deviation:	-9.981 %
positive rtv:	6.967 %
negative rtv:	-6.688 %

STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAS Lemoore (1998)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $700,150 (Annual procurement of $1,400,300 for a half year)
Change in expenditures for local services and supplies: $428,594.28 (calculated)

Change in civilian employment: 10 (Half the 40 civilian personnel for half a year, assuming immediate ramp-up in July 1998)
Average income of affected civilian personnel: $30,861
Percent expected to relocate: (0.0) 100.0 percent (20 are assumed to relocate)
Change in military employment: 237 (Half of the 948 military personnel for half a year, assuming immediate ramp-up in July 1998)
Average income of affected military personnel: $37,230
Percent of military living on the base: 33.0 percent (The unaccompanied personnel are assumed to live in BOQ/BEQ)

STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAS Lemoore (1998)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$4,040,000	
Induced:	$6,377,000	
Total:	$10,417,000	(0.077%)
Employment .... Direct:	31	
Total:	328	(0.095%)
Income .... Direct:	$578,000	
Total (place of work):	$10,622,000	
Total (place of residence):	$10,530,000	(0.086%)
Local population ....:	619	(0.088%)
Local off-base population ....:	424	
Number of school children ....:	104	
Demand for housing .... Rental:	106	
Owner occupied:	63	
Government expenditures............:	$959,000	
Government revenues ....:	$1,570,000	
Net Government revenues ....:	$610,000	
Civilian employees expected to relocate:	10	
Military employees expected to relocate:	237	

STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAS Lemoore (1999)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $1,400,300
Change in expenditures for local services and supplies: $857,188.56 (calculated)

Change in civilian employment: 40 (Assuming immediate ramp-up of remaining E-2 personnel in January 1999)
Average income of affected civilian personnel: $30,861
Percent expected to relocate: (0.0) 100.0 percent (20 are assumed to relocate)
Change in military employment: 948 (Assuming immediate ramp-up of remaining E-2 personnel in January 1999)
Average income of affected military personnel: $37,230
Percent of military living on the base: 33.0 percent

STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAS Lemoore (1999)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$15,304,000	
Induced:	$24,154,000	
Total:	$39,458,000	(0.292%)
Employment .... Direct:	119	
Total:	1,294	(0.373%)
Income .... Direct:	$2,188,000	
Total (place of work):	$42,171,000	
Total (place of residence):	$41,809,000	(0.343%)
Local population ....:	2,476	(0.351%)
Local off-base population ....:	1,697	
Number of school children ....:	416	
Demand for housing .... Rental:	425	
Owner occupied:	250	
Government expenditures............:	$3,805,000	
Government revenues ....:	$6,253,000	
Net Government revenues ....:	$2,448,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	948	

STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAS Lemoore (2000)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $1,400,300
Change in expenditures for local services and supplies: $857,188.56 (calculated)

Change in civilian employment: 40
Average income of affected civilian personnel: $30,861
Percent expected to relocate: (0.0) 100.0 percent
Change in military employment: 948
Average income of affected military personnel: $37,230
Percent of military living on the base: 33.0 percent

STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAS Lemoore (2000)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$15,304,000	
Induced:	$24,154,000	
Total:	$39,458,000	(0.292%)
Employment .... Direct:	119	
Total:	1,294	(0.373%)
Income .... Direct:	$2,188,000	
Total (place of work):	$42,171,000	
Total (place of residence):	$41,809,000	(0.343%)
Local population ....:	2,476	(0.351%)
Local off-base population ....:	1,697	
Number of school children ....:	416	
Demand for housing .... Rental:	425	
Owner occupied:	250	
Government expenditures............:	$3,805,000	
Government revenues ....:	$6,253,000	
Net Government revenues ....:	$2,448,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	948	

STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAS Lemoore (2001)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $1,400,300
Change in expenditures for local services and supplies: $857,188.56 (calculated)

Change in civilian employment: 40
Average income of affected civilian personnel: $30,861
Percent expected to relocate: (0.0) 100.0 percent
t
Change in military employment: 948
Average income of affected military personnel: $37,230
Percent of military living on the base: 33.0 percent

STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAS Lemoore (2001)

Export income multiplier:		2.5783	
Change in local			
Sales volume	Direct:	$15,304,000	
	Induced:	$24,154,000	
	Total:	$39,458,000	(0.292%)
Employment	Direct:	119	
	Total:	1,294	(0.373%)
Income	Direct:	$2,188,000	
	Total (place of work):	$42,171,000	
	Total (place of residence):	$41,809,000	(0.343%)
Local population ....:		2,476	(0.351%)
Local off-base population ....:		1,697	
Number of school children ....:		416	
Demand for housing	Rental:	425	
	Owner occupied:	250	
Government expenditures............:		$3,805,000	
Government revenues ....:		$6,253,000	
Net Government revenues ....:		$2,448,000	
Civilian employees expected to relocate:		40	
Military employees expected to relocate:		948	

CONSTRUCTION

Project name: E-2 Realignment to NAS Lemoore (1998)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $22,625,000
Local expenditures of project: $13,849,811.29 (calculated)
Percent for labor: (34.2)
Percent for materials: (57.8)
Percent allowed for other: 8.00 (calculated)
Percent of construction workers expected to migrate into the area: (30.0)

CONSTRUCTION IMPACT FORECAST FOR E-2 Realignment to NAS Lemoore (1998)

Export income multiplier:		2.5783	
Change in local			
Sales volume	Direct:	$11,813,000	
	Induced:	$18,645,000	
	Total:	$30,459,000	(0.220%)
Employment	Direct:	90	
	Total:	381	(0.110%)
Income	Direct:	$1,653,000	
	Total (place of work):	$9,324,000	
	Total (place of residence):	$9,274,000	(0.076%)
Local population ....:		102	(0.014%)
Local off-base population ....:		102	
Number of school children ....:		18	
Demand for housing	Rental:	45	
	Owner occupied:	0	
Government expenditures............:		$898,000	
Government revenues ....:		$936,000	
Net Government revenues ....:		$37,000	
Civilian employees expected to relocate:		45	
Military employees expected to relocate:		0	

CONSTRUCTION

Project name: E-2 Realignment to NAS Lemoore (1999)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $31,383,000
Local expenditures of project: $19,210,989.07 (calculated)
Percent for labor: (34.2)
Percent for materials: (57.8)
Percent allowed for other: 8.00 (calculated)
Percent of construction workers expected to migrate into the area: (30.0)

CONSTRUCTION IMPACT FORECAST FOR E-2 Realignment to NAS Lemoore (1999)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$16,386,000	
Induced:	$25,862,000	
Total:	$42,249,000	(0.306%)
Employment .... Direct:	124	
Total:	528	(0.152%)
Income .... Direct:	$2,294,000	
Total (place of work):	$12,934,000	
Total (place of residence):	$12,864,000	(0.106%)
Local population ....:	141	(0.020%)
Local off-base population ....:	141	
Number of school children ....:	25	
Demand for housing .... Rental:	62	
Owner occupied:	0	
Government expenditures............:	$1,246,000	
Government revenues ....:	$1,298,000	
Net Government revenues ....:	$52,000	
Civilian employees expected to relocate:	62	
Military employees expected to relocate:	0	

CONSTRUCTION

Project name: E-2 Realignment to NAS Lemoore (2000)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $4,379,000
Local expenditures of project: $2,680,588.89 (calculated)
Percent for labor: (34.2)
Percent for materials: (57.8)
Percent allowed for other: 8.00 (calculated)
Percent of construction workers expected to migrate into the area: (30.0)

CONSTRUCTION IMPACT FORECAST FOR E-2 Realignment to NAS Lemoore (2000)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$2,286,000	
Induced:	$3,609,000	
Total:	$5,895,000	(0.043%)
Employment .... Direct:	17	
Total:	74	(0.021%)
Income .... Direct:	$320,000	
Total (place of work):	$1,805,000	
Total (place of residence):	$1,795,000	(0.015%)
Local population ....:	20	(0.003%)
Local off-base population ....:	20	
Number of school children ....:	3	
Demand for housing .... Rental:	9	
Owner occupied:	0	
Government expenditures............:	$174,000	
Government revenues ....:	$181,000	
Net Government revenues ....:	$7,000	
Civilian employees expected to relocate:	9	
Military employees expected to relocate:	0	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAS Lemoore (1998)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $700,150
Change in civilian employment: 10
Average income of affected civilian personnel: $30,861
Percent expected to relocate: 100%
Change in military employment: 237
Average income of affected military personnel: $37,230
Percent of military living on the base: 33.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAS LEMOORE (1998)

Export income multiplier:		2.5783	
Change in local			
Sales volume	Direct:	$3,374,000	
	Induced:	$5,326,000	
	Total:	$8,700,000	(0.064%)
Employment	Direct:	26	
	Total:	314	(0.091%)
Income	Direct:	$482,000	
	Total (place of work):	$7,979,000	
	Total (place of residence):	$7,910,000	(0.065%)
Local population ....:		619	(0.088%)
Local off-base population ....:		424	
Number of school children ....:		104	
Demand for housing	Rental:	106	
	Owner occupied:	63	
Government expenditures............:		$934,000	
Government revenues ....:		$1,353,000	
Net Government revenues ....:		$418,000	
Civilian employees expected to relocate:		10	
Military employees expected to relocate:		237	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAS Lemoore (1999)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $967,689
Change in civilian employment: 160
Average income of affected civilian personnel: $30,861
Percent expected to relocate: 25%
Change in military employment: 1,115
Average income of affected military personnel: $37,230
Percent of military living on the base: 34.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAS LEMOORE (1999)

Export income multiplier:		2.5783	
Change in local			
Sales volume	Direct:	$20,443,000	
	Induced:	$32,265,000	
	Total:	$52,708,000	(0.389%)
Employment	Direct:	159	
	Total:	1,684	(0.486%)
Income	Direct:	$2,923,000	
	Total (place of work):	$53,986,000	
	Total (place of residence):	$53,514,000	(0.439%)
Local population ....:		2,892	(0.410%)
Local off-base population ....:		1,948	
Number of school children ....:		486	
Demand for housing	Rental:	489	
	Owner occupied:	287	
Government expenditures............:		$4,687,000	
Government revenues ....:		$7,635,000	
Net Government revenues ....:		$2,948,000	
Civilian employees expected to relocate:		40	
Military employees expected to relocate:		1,115	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAS Lemoore (2000)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $964,689
Change in civilian employment: 160
Average income of affected civilian personnel: $30,861
Percent expected to relocate: 25.0%
Change in military employment: 1,542
Average income of affected military personnel: $37,230
Percent of military living on the base: 36.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAS LEMOORE (2000)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$26,286,000	
Induced:	$41,486,000	
Total:	$67,772,000	(0.501%)
Employment .... Direct:	204	
Total:	2,228	(0.643%)
Income .... Direct:	$3,759,000	
Total (place of work):	$72,037,000	
Total (place of residence):	$71,429,000	(0.587%)
Local population ....:	3,955	(0.561%)
Local off-base population ....:	2,573	
Number of school children ....:	667	
Demand for housing .... Rental:	650	
Owner occupied:	377	
Government expenditures............:	$6,069,000	
Government revenues ....:	$10,147,000	
Net Government revenues ....:	$4,078,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	1,542	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAS Lemoore (2001)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $964,689
Change in civilian employment: 160
Average income of affected civilian personnel: $30,861
Percent expected to relocate: 25.0%
Change in military employment: 1,728
Average income of affected military personnel: $37,230
Percent of military living on the base: 41.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAS LEMOORE (2001)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$28,274,000	
Induced:	$44,624,000	
Total:	$72,897,000	(0.539%)
Employment .... Direct:	219	
Total:	2,453	(0.708%)
Income .... Direct:	$4,043,000	
Total (place of work):	$79,695,000	
Total (place of residence):	$79,064,000	(0.649%)
Local population ....:	4,418	(0.627%)
Local off-base population ....:	2,654	
Number of school children ....:	745	
Demand for housing .... Rental:	671	
Owner occupied:	389	
Government expenditures............:	$6,294,000	
Government revenues ....:	$10,913,000	
Net Government revenues ....:	$4,619,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	1,728	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAS Lemoore (2002)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $964,689
Change in civilian employment: 160
Average income of affected civilian personnel: $30,861
Percent expected to relocate: 25.0%
Change in military employment: 2,006
Average income of affected military personnel: $37,230
Percent of military living on the base: 41.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAS LEMOORE (2002)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$32,082,000	
Induced:	$50,635,000	
Total:	$82,716,000	(0.611%)
Employment .... Direct:	249	
Total:	2,808	(0.810%)
Income .... Direct:	$4,587,000	
Total (place of work):	$91,449,000	
Total (place of residence):	$90,729,000	(0.745%)
Local population ....:	5,110	(0.725%)
Local off-base population ....:	3,062	
Number of school children ....:	863	
Demand for housing .... Rental:	776	
Owner occupied:	448	
Government expenditures............:	$7,197,000	
Government revenues ....:	$12,551,000	
Net Government revenues ....:	$5,354,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	2,006	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAS Lemoore (2003)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $964,689
Change in civilian employment: 160
Average income of affected civilian personnel: $30,861
Percent expected to relocate: 25.0%
Change in military employment: 2,284
Average income of affected military personnel: $37,230
Percent of military living on the base: 38.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAS LEMOORE (2003)

Export income multiplier:		2.5783	
Change in local			
Sales volume	Direct:	$36,388,000	
	Induced:	$57,431,000	
	Total:	$93,819,000	(0.693%)
Employment	Direct:	282	
	Total:	3,172	(0.915%)
Income	Direct:	$5,203,000	
	Total (place of work):	$103,386,000	
	Total (place of residence):	$102,545,000	(0.842%)
Local population		5,803	(0.823%)
Local off-base population		3,641	
Number of school children		980	
Demand for housing	Rental:	925	
	Owner occupied:	531	
Government expenditures		$8,436,000	
Government revenues		$14,481,000	
Net Government revenues		$6,046,000	
Civilian employees expected to relocate:		40	
Military employees expected to relocate:		2,284	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAS Lemoore (2004)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $964,689
Change in civilian employment: 160
Average income of affected civilian personnel: $30,861
Percent expected to relocate: 25.0%
Change in military employment: 2,804
Average income of affected military personnel: $37,230
Percent of military living on the base: 38.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAS LEMOORE (2004)

Export income multiplier:		2.5783	
Change in local			
Sales volume	Direct:	$43,625,000	
	Induced:	$68,853,000	
	Total:	$112,478,000	(0.831%)
Employment	Direct:	338	
	Total:	3,836	(1.107%)
Income	Direct:	$6,238,000	
	Total (place of work):	$125,414,000	
	Total (place of residence):	$124,399,000	(1.021%)
Local population	:	7,097	(1.007%)
Local off-base population	:	4,444	
Number of school children	:	1,200	
Demand for housing	Rental:	1,131	
	Owner occupied:	647	
Government expenditures...........	:	$10,201,000	
Government revenues	:	$17,611,000	
Net Government revenues	:	$7,411,000	
Civilian employees expected to relocate:		40	
Military employees expected to relocate:		2,804	

CONSTRUCTION CUMULATIVE IMPACTS

Project name: NAS Lemoore (1998)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $22,625,000
Local expenditures of project: $13,849,811.29 (calculated)
Percent for labor: 34.2%
Percent for materials: 57.8%
Percent allowed for other: 8.0%
Percent of construction workers expected to migrate into the area: 30.0%

CONSTRUCTION IMPACT FORECAST FOR NAS LEMOORE CUMULATIVE IMPACTS (1998)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$11,813,000	
Induced:	$18,645,000	
Total:	$30,459,000	(0.220%)
Employment .... Direct:	90	
Total:	381	(0.110%)
Income .... Direct:	$1,653,000	
Total (place of work):	$9,324,000	
Total (place of residence):	$9,274,000	(0.076%)
Local population ....:	102	(0.014%)
Local off-base population ....:	102	
Number of school children ....:	18	
Demand for housing .... Rental:	45	
Owner occupied:	0	
Government expenditures............:	$898,000	
Government revenues ....:	$936,000	
Net Government revenues ....:	$37,000	
Civilian employees expected to relocate:	45	
Military employees expected to relocate:	0	

CONSTRUCTION CUMULATIVE IMPACTS

Project name: NAS Lemoore (1999)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $51,923,000
Local expenditures of project: $31,784,475.21 (calculated)
Percent for labor: 34.2%
Percent for materials: 57.8%
Percent allowed for other: 8.0%
Percent of construction workers expected to migrate into the area: 30.0%

CONSTRUCTION IMPACT FORECAST FOR NAS LEMOORE CUMULATIVE IMPACTS (1999)

Export income multiplier:		2.5783	
Change in local			
Sales volume	Direct:	$27,111,000	
	Induced:	$42,789,000	
	Total:	$69,900,000	(0.506%)
Employment	Direct:	206	
	Total:	874	(0.252%)
Income	Direct:	$3,795,000	
	Total (place of work):	$21,399,000	
	Total (place of residence):	$21,283,000	(0.175%)
Local population ....:		233	(0.033%)
Local off-base population ....:		233	
Number of school children ....:		41	
Demand for housing	Rental:	103	
	Owner occupied:	0	
Government expenditures............:		$2,061,000	
Government revenues ....:		$2,147,000	
Net Government revenues ....:		$86,000	
Civilian employees expected to relocate:		103	
Military employees expected to relocate:		0	

CONSTRUCTION CUMULATIVE IMPACTS

Project name: NAS Lemoore (2000)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $42,189,000
Local expenditures of project: $25,825,842.59 (calculated)
Percent for labor: 34.2%
Percent for materials: 57.8%
Percent allowed for other: 8.0%
Percent of construction workers expected to migrate into the area: 30.0%

CONSTRUCTION IMPACT FORECAST FOR NAS LEMOORE CUMULATIVE IMPACTS (2000)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$22,029,000	
Induced:	$34,768,000	
Total:	$56,796,000	(0.411%)
Employment .... Direct:	167	
Total:	710	(0.205%)
Income .... Direct:	$3,083,000	
Total (place of work):	$17,387,000	
Total (place of residence):	$17,293,000	(0.142%)
Local population ....:	189	(0.027%)
Local off-base population ....:	189	
Number of school children ....:	34	
Demand for housing .... Rental:	84	
Owner occupied:	0	
Government expenditures............:	$1,675,000	
Government revenues ....:	$1,744,000	
Net Government revenues ....:	$70,000	
Civilian employees expected to relocate:	84	
Military employees expected to relocate:	0	

CONSTRUCTION CUMULATIVE IMPACTS

Project name: NAS Lemoore (2001)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $51,000,000
Local expenditures of project: $31,219,464.13 (calculated)
Percent for labor: 34.2%
Percent for materials: 57.8%
Percent allowed for other: 8.0%
Percent of construction workers expected to migrate into the area: 30.0%

CONSTRUCTION IMPACT FORECAST FOR NAS LEMOORE CUMULATIVE IMPACTS (2001)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$26,629,000	
Induced:	$42,029,000	
Total:	$68,658,000	(0.497%)
Employment .... Direct:	202	
Total:	858	(0.248%)
Income .... Direct:	$3,727,000	
Total (place of work):	$21,019,000	
Total (place of residence):	$20,905,000	(0.172%)
Local population ....:	229	(0.032%)
Local off-base population ....:	229	
Number of school children ....:	41	
Demand for housing .... Rental:	101	
Owner occupied:	0	
Government expenditures............:	$2,025,000	
Government revenues ....:	$2,109,000	
Net Government revenues ....:	$84,000	
Civilian employees expected to relocate:	101	
Military employees expected to relocate:	0	

```
CONSTRUCTION CUMULATIVE IMPACTS

Project name:  NAS Lemoore (2002)

Default price deflators:
   baseline year (ex. business volume) (CPI - 1987)        = 100.0
   output and incomes  (ex b.v.)       (CPI - 1993)        = 126.3
   baseline year (construction)        (ENR-const - 1987) = 100.0
   local expenditures for construction (ENR-const - 1993) = 118.2
   output and incomes (construction)   (ENR-const - 1993) = 118.2

If entering total expenditures, enter  1
            local expenditures, enter  2  : 1
Dollar volume of construction project:  $28,150,000
Local expenditures of project:  $17,231,919.90 (calculated)
Percent for labor:  34.2%
Percent for materials:  57.8%
Percent allowed for other:  8.0%
Percent of construction workers expected to migrate into the area: 30.0%


CONSTRUCTION IMPACT FORECAST FOR NAS LEMOORE CUMULATIVE IMPACTS (2002)

Export income multiplier:                          2.5783
Change in local
  Sales volume .............. Direct:         $14,698,000
                             Induced:         $23,198,000
                               Total:         $37,896,000    (    0.274%)
  Employment ................ Direct:                 112
                               Total:                 474    (    0.137%)
  Income .................... Direct:          $2,057,000
              Total (place of work):          $11,601,000
         Total (place of residence):          $11,539,000    (    0.095%)
  Local population .................:                 126    (    0.018%)
  Local off-base population ........:                 126
  Number of school children ........:                  22
  Demand for housing ......... Rental:                 56
                      Owner occupied:                   0
  Government expenditures...........:          $1,717,000
  Government revenues ..............:          $1,164,000
  Net Government revenues ..........:            $47,000
Civilian employees expected to relocate:               56
Military employees expected to relocate:                0
```

CONSTRUCTION CUMULATIVE IMPACTS

Project name: NAS Lemoore (2003)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $24,802,000
Local expenditures of project: $15,182,453.91 (calculated)
Percent for labor: 34.2%
Percent for materials: 57.8%
Percent allowed for other: 8.0%
Percent of construction workers expected to migrate into the area: 30.0%

CONSTRUCTION IMPACT FORECAST FOR NAS LEMOORE CUMULATIVE IMPACTS (2003)

Export income multiplier:	2.5783	
Change in local		
Sales volume .... Direct:	$12,950,000	
Induced:	$20,439,000	
Total:	$33,389,000	(0.241%)
Employment .... Direct:	98	
Total:	417	(0.120%)
Income .... Direct:	$1,813,000	
Total (place of work):	$10,222,000	
Total (place of residence):	$10,166,000	(0.083%)
Local population ....:	111	(0.016%)
Local off-base population ....:	111	
Number of school children ....:	20	
Demand for housing .... Rental:	49	
Owner occupied:	0	
Government expenditures............:	$985,000	
Government revenues ....:	$1,026,000	
Net Government revenues ....:	$41,000	
Civilian employees expected to relocate:	49	
Military employees expected to relocate:	0	

EIFS Model Results for NAF El Centro

RATIONAL THRESHOLD VALUES
NAF El Centro
Imperial County

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

EMPLOYMENT

YEAR	Employment	change	deviation	%deviation
1969	33,653			
1970	33,858	205	-646	-1.919 %
1971	33,916	58	-793	-2.342 %
1972	34,936	1,020	169	0.498 %
1973	36,607	1,671	820	2.347 %
1974	39,457	2,850	1,999	5.461 %
1975	42,220	2,763	1,912	4.846 %
1976	44,472	2,252	1,401	3.318 %
1977	44,214	-258	-1,109	-2.494 %
1978	44,479	265	-586	-1.325 %
1979	46,474	1,995	1,144	2.572 %
1980	45,249	-1,225	-2,076	-4.467 %
1981	43,737	-1,512	-2,363	-5.222 %
1982	43,474	-263	-1,114	-2.547 %
1983	43,121	-353	-1,204	-2.769 %
1984	42,637	-484	-1,335	-3.096 %
1985	41,388	-1,249	-2,100	-4.925 %
1986	42,777	1,389	538	1.300 %
1987	43,760	983	132	0.309 %
1988	47,737	3,977	3,126	7.144 %
1989	52,473	4,736	3,885	8.138 %
1990	52,896	423	-428	-0.816 %
1991	51,334	-1,562	-2,413	-4.562 %
1992	53,225	1,891	1,040	2.026 %

average yearly change:	851
maximum historic positive deviation:	3,885
maximum historic negative deviation:	-2,413
maximum historic % positive deviation:	8.138 %
maximum historic % negative deviation:	-5.222 %
positive rtv:	8.138 %
negative rtv:	-3.499 %

RATIONAL THRESHOLD VALUES
NAF El Centro
Imperial County

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

BUSINESS VOLUME (using Non-Farm Income)

YEAR	Non-Farm income	adjusted income	change	deviation	%deviation
1969	152,212	450,331			
1970	161,730	451,760	1,428	-17,842	-3.962 %
1971	171,617	460,099	8,339	-10,931	-2.420 %
1972	186,227	482,453	22,354	3,083	0.670 %
1973	213,909	521,729	39,276	20,005	4.147 %
1974	247,862	544,752	23,022	3,752	0.719 %
1975	280,774	564,938	20,186	915	0.168 %
1976	318,020	605,752	40,815	21,544	3.814 %
1977	345,578	618,207	12,455	-6,816	-1.125 %
1978	382,167	634,829	16,621	-2,649	-0.429 %
1979	429,228	640,639	5,810	-13,461	-2.120 %
1980	461,457	606,382	-34,256	-53,527	-8.355 %
1981	492,046	586,467	-19,915	-39,186	-6.462 %
1982	502,661	565,423	-21,044	-40,315	-6.874 %
1983	506,253	552,678	-12,745	-32,016	-5.662 %
1984	552,581	582,891	30,213	10,943	1.980 %
1985	588,297	599,691	16,800	-2,471	-0.424 %
1986	645,186	668,587	68,895	49,625	8.275 %
1987	700,289	700,289	31,702	12,432	1.859 %
1988	792,804	762,312	62,023	42,752	6.105 %
1989	866,829	795,256	32,944	13,674	1.794 %
1990	957,500	834,786	39,530	20,260	2.548 %
1991	995,033	833,361	-1,425	-20,696	-2.479 %
1992	1,097,293	893,561	60,200	40,929	4.911 %

average yearly change:	19,271
maximum historic positive deviation:	49,625
maximum historic negative deviation:	-53,527
maximum historic % positive deviation:	8.275 %
maximum historic % negative deviation:	-8.355 %
positive rtv:	8.275 %
negative rtv:	-6.266 %

RATIONAL THRESHOLD VALUES
NAF El Centro
Imperial County

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

PERSONAL INCOME

YEAR	Personal income	adjusted income	change	deviation	%deviation
1969	268,690	794,941			
1970	281,882	787,380	-7,561	-36,138	-4.546 %
1971	281,045	753,472	-33,908	-62,485	-7.936 %
1972	363,601	941,972	188,500	159,923	21.225 %
1973	401,349	978,900	36,928	8,352	0.887 %
1974	462,279	1,015,998	37,098	8,521	0.870 %
1975	490,557	987,036	-28,962	-57,538	-5.663 %
1976	549,020	1,045,752	58,716	30,139	3.054 %
1977	569,560	1,018,891	-26,862	-55,438	-5.301 %
1978	625,286	1,038,681	19,790	-8,787	-0.862 %
1979	900,513	1,344,049	305,368	276,791	26.648 %
1980	854,260	1,122,549	-221,500	-250,077	-18.606 %
1981	893,129	1,064,516	-58,033	-86,610	-7.715 %
1982	987,808	1,111,145	46,629	18,052	1.696 %
1983	1,028,069	1,122,346	11,201	-17,376	-1.564 %
1984	1,066,454	1,124,951	2,605	-25,971	-2.314 %
1985	1,062,805	1,083,389	-41,562	-70,139	-6.235 %
1986	1,092,758	1,132,392	49,002	20,426	1.885 %
1987	1,259,735	1,259,735	127,343	98,767	8.722 %
1988	1,439,442	1,384,079	124,344	95,767	7.602 %
1989	1,599,199	1,467,155	83,076	54,499	3.938 %
1990	1,693,858	1,476,772	9,617	-18,959	-1.292 %
1991	1,684,094	1,410,464	-66,309	-94,885	-6.425 %
1992	1,783,310	1,452,207	41,743	13,166	0.933 %

average yearly change:	28,577
maximum historic positive deviation:	276,791
maximum historic negative deviation:	-250,077
maximum historic % positive deviation:	26.648 %
maximum historic % negative deviation:	-18.606 %
positive rtv:	26.648 %
negative rtv:	-12.466 %

STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAF El Centro (1998)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $700,150 (Annual procurement of $1,400,300 for a half year)
Change in expenditures for local services and supplies: $283,343.25 (calculated)

Change in civilian employment: 26 (Half the 105 civilian personnel for half a year, assuming immediate ramp-up in July of 1998)
Average income of affected civilian personnel: $25,734
Percent expected to relocate: (0.0) 38.1 percent (20 are assumed to relocate; the other 32 would be hired at the local economy level)
Change in military employment: 237 (Half the 948 military personnel for half a year, assuming immediate ramp-up in July 1998)
Average income of affected military personnel: $27,331
Percent of military living on the base: 33.0 percent (The unaccompanied personnel who are assumed to live in BOQ/BEQ)

STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAF El Centro (1998)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$3,261,000	
Induced:	$2,217,000	
Total:	$5,477,000	(0.358%)
Employment .... Direct:	24	
Total:	304	(0.694%)
Income .... Direct:	$405,000	
Total (place of work):	$7,827,000	
Total (place of residence):	$7,827,000	(0.492%)
Local population ....:	620	(0.599%)
Local off-base population ....:	425	
Number of school children ....:	106	
Demand for housing .... Rental:	106	
Owner occupied:	63	
Government expenditures............:	$1,065,000	
Government revenues ....:	$2,286,000	
Net Government revenues ....:	$1,221,000	
Civilian employees expected to relocate:	10	
Military employees expected to relocate:	237	

STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAF El Centro (1999)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $1,400,300
Change in expenditures for local services and supplies: $566,686.50 (calculated)

Change in civilian employment: 105 (Assuming immediate ramp-up of remaining E-2 personnel in January 1999)
Average income of affected civilian personnel: $25,734
Percent expected to relocate: (0.0) 38.1 percent (20 are assumed to relocate; the other 32 would be hired at the local economy level)
Change in military employment: 948 (Assuming immediate ramp-up of remaining E-2 personnel in January 1999)
Average income of affected military personnel: $27,331
Percent of military living on the base: 33.0 percent

STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAF El Centro (1999)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$12,495,000	
Induced:	$8,494,000	
Total:	$20,989,000	(1.371%)
Employment .... Direct:	93	
Total:	1,210	(2.764%)
Income .... Direct:	$1,552,000	
Total (place of work):	$31,218,000	
Total (place of residence):	$31,218,000	(1.962%)
Local population ....:	2,480	(2.399%)
Local off-base population ....:	1,701	
Number of school children ....:	425	
Demand for housing .... Rental:	423	
Owner occupied:	252	
Government expenditures............:	$4,248,000	
Government revenues ....:	$9,127,000	
Net Government revenues ....:	$4,879,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	948	

STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAF El Centro (2000)

Default price deflators:

baseline year (ex: business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $1,400,300
Change in expenditures for local services and supplies: $566,686.50 (calculated)

Change in civilian employment: 105
Average income of affected civilian personnel: $25,734
Percent expected to relocate: (0.0) 38.1 percent

Change in military employment: 948
Average income of affected military personnel: $27,331
Percent of military living on the base: 33.0 percent

STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAF El Centro (2000)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$12,495,000	
Induced:	$8,494,000	
Total:	$20,989,000	(1.371%)
Employment .... Direct:	93	
Total:	1,210	(2.764%)
Income .... Direct:	$1,552,000	
Total (place of work):	$31,218,000	
Total (place of residence):	$31,218,000	(1.962%)
Local population ....:	2,480	(2.399%)
Local off-base population ....:	1,701	
Number of school children ....:	425	
Demand for housing .... Rental:	423	
Owner occupied:	252	
Government expenditures............:	$4,248,000	
Government revenues ....:	$9,127,000	
Net Government revenues ....:	$4,879,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	948	

STANDARD EIFS FORECAST MODEL

Project name: E-2 Realignment to NAF El Centro (2001)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Change in expenditures for services and supplies: $1,400,300
Change in expenditures for local services and supplies: $566,686.50 (calculated)

Change in civilian employment: 105
Average income of affected civilian personnel: $25,734
Percent expected to relocate: (0.0) 38.1 percent

Change in military employment: 948
Average income of affected military personnel: $27,331
Percent of military living on the base: 33.0 percent

STANDARD EIFS MODEL FORECAST FOR E-2 Realignment to NAF El Centro (2001)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$12,495,000	
Induced:	$8,494,000	
Total:	$20,989,000	(1.371%)
Employment .... Direct:	93	
Total:	1,210	(2.764%)
Income .... Direct:	$1,552,000	
Total (place of work):	$31,218,000	
Total (place of residence):	$31,218,000	(1.962%)
Local population ....:	2,480	(2.399%)
Local off-base population ....:	1,701	
Number of school children ....:	425	
Demand for housing .... Rental:	423	
Owner occupied:	252	
Government expenditures............:	$4,248,000	
Government revenues ....:	$9,127,000	
Net Government revenues ....:	$4,879,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	948	

CONSTRUCTION

Project name: E-2 Realignment to NAF El Centro (1998)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $27,329,000
Local expenditures of project: $11,059,755.43 (calculated)
Percent for labor: (34.2)
Percent for materials: (57.8)
Percent allowed for other: 8.00 (calculated)
Percent of construction workers expected to migrate into the area: (30.0)

CONSTRUCTION IMPACT FORECAST FOR E-2 Realignment to NAF El Centro (1998)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$9,434,000	
Induced:	$6,413,000	
Total:	$15,847,000	(1.014%)
Employment .... Direct:	69	
Total:	238	(0.544%)
Income .... Direct:	$1,147,000	
Total (place of work):	$5,968,000	
Total (place of residence):	$5,968,000	(0.375%)
Local population ....:	83	(0.081%)
Local off-base population ....:	83	
Number of school children ....:	15	
Demand for housing .... Rental:	37	
Owner occupied:	0	
Government expenditures............:	$696,000	
Government revenues ....:	$1,315,000	
Net Government revenues ....:	$619,000	
Civilian employees expected to relocate:	37	
Military employees expected to relocate:	0	

CONSTRUCTION

Project name: E-2 Realignment to NAF El Centro (1999)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $37,450,000
Local expenditures of project: $15,155,616.41 (calculated)
Percent for labor: (34.2)
Percent for materials: (57.8)
Percent allowed for other: 8.00 (calculated)
Percent of construction workers expected to migrate into the area: (30.0)

CONSTRUCTION IMPACT FORECAST FOR E-2 Realignment to NAF El Centro (1999)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$12,927,000	
Induced:	$8,788,000	
Total:	$21,715,000	(1.389%)
Employment .... Direct:	94	
Total:	326	(0.746%)
Income .... Direct:	$1,571,000	
Total (place of work):	$8,178,000	
Total (place of residence):	$8,178,000	(0.514%)
Local population ....:	114	(0.110%)
Local off-base population ....:	114	
Number of school children ....:	20	
Demand for housing .... Rental:	50	
Owner occupied:	0	
Government expenditures............:	$953,000	
Government revenues ....:	$1,802,000	
Net Government revenues ....:	$848,000	
Civilian employees expected to relocate:	50	
Military employees expected to relocate:	0	

CONSTRUCTION

Project name: E-2 Realignment to NAF El Centro (2000)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1

Dollar volume of construction project: $5,061,000
Local expenditures of project: $2,048,132.83 (calculated)
Percent for labor: (34.2)
Percent for materials: (57.8)
Percent allowed for other: 8.00 (calculated)
Percent of construction workers expected to migrate into the area: (30.0)

CONSTRUCTION IMPACT FORECAST FOR E-2 Realignment to NAF El Centro (2000)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$1,747,000	
Induced:	$1,188,000	
Total:	$2,935,000	(0.188%)
Employment .... Direct:	13	
Total:	44	(0.101%)
Income .... Direct:	$212,000	
Total (place of work):	$1,105,000	
Total (place of residence):	$1,105,000	(0.069%)
Local population ....:	15	(0.015%)
Local off-base population ....:	15	
Number of school children ....:	2	
Demand for housing .... Rental:	7	
Owner occupied:	0	
Government expenditures............:	$129,000	
Government revenues ....:	$244,000	
Net Government revenues ....:	$115,000	
Civilian employees expected to relocate:	7	
Military employees expected to relocate:	0	

RATIONAL THRESHOLD VALUES
NAF El Centro
Imperial County

All dollar amounts are in thousands of dollars.
Dollar adjustment based on Consumer Price Index (1987=100).

POPULATION

YEAR	Population	change	deviation	%deviation
1969	73,600			
1970	74,800	1,200	-1,209	-1.642 %
1971	74,900	100	-2,309	-3.086 %
1972	75,900	1,000	-1,409	-1.881 %
1973	79,600	3,700	1,291	1.701 %
1974	81,500	1,900	-509	-0.639 %
1975	83,000	1,500	-909	-1.115 %
1976	85,300	2,300	-109	-0.131 %
1977	87,000	1,700	-709	-0.831 %
1978	88,500	1,500	-909	-1.044 %
1979	90,100	1,600	-809	-0.914 %
1980	92,900	2,800	391	0.434 %
1981	94,800	1,900	-509	-0.548 %
1982	96,600	1,800	-609	-0.642 %
1983	98,300	1,700	-709	-0.734 %
1984	99,300	1,000	-1,409	-1.433 %
1985	101,500	2,200	-209	-0.210 %
1986	101,700	200	-2,209	-2.176 %
1987	103,400	1,700	-709	-0.697 %
1988	105,700	2,300	-109	-0.105 %
1989	107,800	2,100	-309	-0.292 %
1990	111,100	3,300	891	0.827 %
1991	118,500	7,400	4,991	4.493 %
1992	129,000	10,500	8,091	6.828 %

average yearly change:	2,409
maximum historic positive deviation:	8,091
maximum historic negative deviation:	-2,309
maximum historic % positive deviation:	6.828 %
maximum historic % negative deviation:	-3.086 %
positive rtv:	6.828 %
negative rtv:	-1.543 %

Source: Bureau of Economic Analysis

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAF El Centro (1998)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $283,343
Change in civilian employment: 26
Average income of affected civilian personnel: $25,734
Percent expected to relocate: 38.1%
Change in military employment: 237
Average income of affected military personnel: $27,331
Percent of military living on the base: 33.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAF EL CENTRO (1998)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$2,977,000	
Induced:	$2,024,000	
Total:	$5,001,000	(0.327%)
Employment .... Direct:	22	
Total:	300	(0.686%)
Income .... Direct:	$370,000	
Total (place of work):	$7,768,000	
Total (place of residence):	$7,768,000	(0.488%)
Local population ....:	620	(0.599%)
Local off-base population ....:	425	
Number of school children ....:	104	
Demand for housing .... Rental:	106	
Owner occupied:	63	
Government expenditures............:	$1,057,000	
Government revenues ....:	$2,274,000	
Net Government revenues ....:	$1,217,000	
Civilian employees expected to relocate:	10	
Military employees expected to relocate:	237	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAF El Centro (1999)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $674,187
Change in civilian employment: 305
Average income of affected civilian personnel: $29,096
Percent expected to relocate: 13.12%
Change in military employment: 1,101
Average income of affected military personnel: $28,707
Percent of military living on the base: 34.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAF EL CENTRO (1999)

Export income multiplier:		1.6798	
Change in local			
Sales volume	Direct:	$19,272,000	
	Induced:	$13,101,000	
	Total:	$32,373,000	(2.115%)
Employment	Direct:	144	
	Total:	1,648	(3.765%)
Income	Direct:	$2,393,000	
	Total (place of work):	$44,501,000	
	Total (place of residence):	$44,501,000	(2.797%)
Local population ....:		2,861	(2.767%)
Local off-base population ....:		1,929	
Number of school children ....:		491	
Demand for housing	Rental:	482	
	Owner occupied:	285	
Government expenditures............:		$5,358,000	
Government revenues ....:		$12,129,000	
Net Government revenues ....:		$6,771,000	
Civilian employees expected to relocate:		40	
Military employees expected to relocate:		1,101	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAF El Centro (2000)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $674,187
Change in civilian employment: 305
Average income of affected civilian personnel: $29,096
Percent expected to relocate: 13.12%
Change in military employment: 1,750
Average income of affected military personnel: $31,868
Percent of military living on the base: 37.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAF EL CENTRO (2000)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$28,166,000	
Induced:	$19,147,000	
Total:	$47,314,000	(3.092%)
Employment .... Direct:	210	
Total:	2,408	(5.503%)
Income .... Direct:	$3,498,000	
Total (place of work):	$70,519,000	
Total (place of residence):	$70,519,000	(4.432%)
Local population ....:	4,477	(4.330%)
Local off-base population ....:	2,865	
Number of school children ....:	771	
Demand for housing .... Rental:	723	
Owner occupied:	420	
Government expenditures............:	$7,625,000	
Government revenues ....:	$18,879,000	
Net Government revenues ....:	$11,254,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	1,750	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAF El Centro (2001)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $674,187
Change in civilian employment: 305
Average income of affected civilian personnel: $29,096
Percent expected to relocate: 13.12%
Change in military employment: 1,918
Average income of affected military personnel: $32,337
Percent of military living on the base: 37.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAF EL CENTRO (2001)

Export income multiplier:		1.6798	
Change in local			
Sales volume	Direct:	$30,516,000	
	Induced:	$20,745,000	
	Total:	$51,261,000	(3.349%)
Employment	Direct:	228	
	Total:	2,605	(5.945%)
Income	Direct:	$3,790,000	
	Total (place of work):	$77,263,000	
	Total (place of residence):	$77,263,000	(4.856%)
Local population ....:		4,895	(4.734%)
Local off-base population ....:		3,128	
Number of school children ....:		843	
Demand for housing	Rental:	790	
	Owner occupied:	458	
Government expenditures............:		$8,259,000	
Government revenues ....:		$20,666,000	
Net Government revenues ....:		$12,407,000	
Civilian employees expected to relocate:		40	
Military employees expected to relocate:		1,918	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAF El Centro (2002)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $674,187
Change in civilian employment: 305
Average income of affected civilian personnel: $29,096
Percent expected to relocate: 13.12%
Change in military employment: 2,192
Average income of affected military personnel: $32,949
Percent of military living on the base: 38.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAF EL CENTRO (2002)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$34,209,000	
Induced:	$23,255,000	
Total:	$57,463,000	(3.755%)
Employment .... Direct:	255	
Total:	2,926	(6.686%)
Income .... Direct:	$4,248,000	
Total (place of work):	$88,235,000	
Total (place of residence):	$88,235,000	(5.546%)
Local population ....:	5,578	(5.394%)
Local off-base population ....:	3,504	
Number of school children ....:	961	
Demand for housing .... Rental:	887	
Owner occupied:	512	
Government expenditures............:	$9,172,000	
Government revenues ....:	$23,478,000	
Net Government revenues ....:	$14,307,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	2,192	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAF El Centro (2003)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $674,187
Change in civilian employment: 305
Average income of affected civilian personnel: $29,096
Percent expected to relocate: 13.12%
Change in military employment: 2,466
Average income of affected military personnel: $33,425
Percent of military living on the base: 38.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAF EL CENTRO (2003)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$38,022,000	
Induced:	$25,847,000	
Total:	$63,870,000	(4.173%)
Employment .... Direct:	284	
Total:	3,248	(7.421%)
Income .... Direct:	$4,722,000	
Total (place of work):	$99,232,000	
Total (place of residence):	$99,232,000	(6.237%)
Local population ....:	6,260	(6.054%)
Local off-base population ....:	3,927	
Number of school children ....:	1,079	
Demand for housing .... Rental:	995	
Owner occupied:	573	
Government expenditures............:	$10,191,000	
Government revenues ....:	$26,380,000	
Net Government revenues ....:	$16,190,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	2,466	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAF El Centro (2004)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $674,187
Change in civilian employment: 305
Average income of affected civilian personnel: $29,096
Percent expected to relocate: 13.12%
Change in military employment: 3,473
Average income of affected military personnel: $33,425
Percent of military living on the base: 39.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAF EL CENTRO (2004)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$51,802,000	
Induced:	$35,215,000	
Total:	$87,017,000	(5.686%)
Employment .... Direct:	387	
Total:	4,427	(10.117%)
Income .... Direct:	$6,433,000	
Total (place of work):	$139,597,000	
Total (place of residence):	$139,597,000	(8.774%)
Local population ....:	8,767	(8.479%)
Local off-base population ....:	5,395	
Number of school children ....:	1,514	
Demand for housing .... Rental:	1,373	
Owner occupied:	786	
Government expenditures............:	$13,742,000	
Government revenues ....:	$36,881,000	
Net Government revenues ....:	$23,139,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	3,473	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAF El Centro (2005)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $674,187
Change in civilian employment: 305
Average income of affected civilian personnel: $29,096
Percent expected to relocate: 13.12%
Change in military employment: 3,932
Average income of affected military personnel: $34,843
Percent of military living on the base: 39.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAF EL CENTRO (2005)

Export income multiplier:		1.6798	
Change in local			
Sales volume	Direct:	$58,156,000	
	Induced:	$39,534,000	
	Total:	$97,691,000	(6.383%)
Employment	Direct:	434	
	Total:	4,966	(11.348%)
Income	Direct:	$7,222,000	
	Total (place of work):	$158,009,000	
	Total (place of residence):	$158,009,000	(9.931%)
Local population	:	9,910	(9.584%)
Local off-base population	:	6,092	
Number of school children	:	1,711	
Demand for housing	Rental:	1,552	
	Owner occupied:	887	
Government expenditures............	:	$15,423,000	
Government revenues	:	$41,720,000	
Net Government revenues	:	$26,297,000	
Civilian employees expected to relocate:		40	
Military employees expected to relocate:		3,932	

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

```
Project name:   NAF El Centro (2006)

Default price deflators:
   baseline year (ex. business volume) (CPI - 1987)       = 100.0
   output and incomes  (ex b.v.)        (CPI - 1993)       = 126.3
   baseline year (business volume)      (PPI - 1987)       = 100.0
   local services and supplies          (PPI - 1993)       = 115.7
   output and incomes (business volume)(PPI - 1993)        = 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter  1
            local expenditures, enter  2  : 2
Change in expenditures for local services and supplies:  $674,187
Change in civilian employment:  305
Average income of affected civilian personnel:  $29,096
Percent expected to relocate:  13.12%
Change in military employment:  3,932
Average income of affected military personnel:  $34,843
Percent of military living on the base:  39.0%
```

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAF EL CENTRO (2006)

```
Export income multiplier:                          1.6798
Change in local
  Sales volume ............... Direct:        $58,156,000
                              Induced:        $39,534,000
                                Total:        $97,691,000    (    6.383%)
  Employment ................. Direct:                434
                                Total:              4,966    (  11.348%)
  Income ..................... Direct:         $7,222,000
              Total (place of work):         $158,009,000
          Total (place of residence):        $158,009,000    (    9.931%)
  Local population ..................:              9,910    (    9.584%)
  Local off-base population .........:              6,092
  Number of school children .........:              1,711
  Demand for housing ......... Rental:              1,552
                       Owner occupied:                887
  Government expenditures............:        $15,423,000
  Government revenues ...............:        $41,720,000
  Net Government revenues ...........:        $26,297,000
Civilian employees expected to relocate:               40
Military employees expected to relocate:            3,932
```

STANDARD EIFS FORECAST MODEL CUMULATIVE IMPACTS

Project name: NAF El Centro (2007)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (business volume)	(PPI - 1987)	= 100.0
local services and supplies	(PPI - 1993)	= 115.7
output and incomes (business volume)	(PPI - 1993)	= 115.7

(Enter decreases as negative numbers)
If entering total expenditures, enter 1
local expenditures, enter 2 : 2
Change in expenditures for local services and supplies: $674,187
Change in civilian employment: 305
Average income of affected civilian personnel: $29,096
Percent expected to relocate: 13.12%
Change in military employment: 2,466
Average income of affected military personnel: $33,425
Percent of military living on the base: 38.0%

STANDARD EIFS MODEL FORECAST FOR CUMULATIVE IMPACTS, NAF EL CENTRO (2007)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$38,022,000	
Induced:	$25,847,000	
Total:	$63,870,000	(4.173%)
Employment .... Direct:	284	
Total:	3,248	(7.421%)
Income .... Direct:	$4,722,000	
Total (place of work):	$99,232,000	
Total (place of residence):	$99,232,000	(6.237%)
Local population ....:	6,260	(6.054%)
Local off-base population ....:	3,927	
Number of school children ....:	1,079	
Demand for housing .... Rental:	995	
Owner occupied:	573	
Government expenditures............:	$10,191,000	
Government revenues ....:	$26,380,000	
Net Government revenues ....:	$16,190,000	
Civilian employees expected to relocate:	40	
Military employees expected to relocate:	2,466	

CONSTRUCTION CUMULATIVE IMPACTS

Project name: NAF El Centro (1998)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $27,329,000
Local expenditures of project: $11,059,755.43 (calculated)
Percent for labor: 34.2%
Percent for materials: 57.8%
Percent allowed for other: 8.0%
Percent of construction workers expected to migrate into the area: 30.0%

CONSTRUCTION IMPACT FORECAST FOR NAF EL CENTRO CUMULATIVE IMPACTS (1998)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$9,434,000	
Induced:	$6,413,000	
Total:	$15,847,000	(1.014%)
Employment .... Direct:	69	
Total:	238	(0.544%)
Income .... Direct:	$1,147,000	
Total (place of work):	$5,968,000	
Total (place of residence):	$5,968,000	(0.375%)
Local population ....:	83	(0.081%)
Local off-base population ....:	83	
Number of school children ....:	15	
Demand for housing .... Rental:	37	
Owner occupied:	0	
Government expenditures............:	$696,000	
Government revenues ....:	$1,315,000	
Net Government revenues ....:	$619,000	
Civilian employees expected to relocate:	37	
Military employees expected to relocate:	0	

CONSTRUCTION CUMULATIVE IMPACTS

Project name: NAF El Centro (1999)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $57,990,000
Local expenditures of project: $23,467,935.79 (calculated)
Percent for labor: 34.2%
Percent for materials: 57.8%
Percent allowed for other: 8.0%
Percent of construction workers expected to migrate into the area: 30.0%

CONSTRUCTION IMPACT FORECAST FOR NAF EL CENTRO CUMULATIVE IMPACTS (1999)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$20,017,000	
Induced:	$13,608,000	
Total:	$33,625,000	(2.151%)
Employment .... Direct:	146	
Total:	505	(1.155%)
Income .... Direct:	$2,433,000	
Total (place of work):	$12,664,000	
Total (place of residence):	$12,664,000	(0.796%)
Local population ....:	177	(0.171%)
Local off-base population ....:	177	
Number of school children ....:	32	
Demand for housing .... Rental:	78	
Owner occupied:	0	
Government expenditures............:	$1,476,000	
Government revenues ....:	$2,790,000	
Net Government revenues ....:	$1,314,000	
Civilian employees expected to relocate:	78	
Military employees expected to relocate:	0	

CONSTRUCTION CUMULATIVE IMPACTS

Project name: NAF El Centro (2000)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $42,871,000
Local expenditures of project: $17,349,437.41 (calculated)
Percent for labor: 34.2%
Percent for materials: 57.8%
Percent allowed for other: 8.0%
Percent of construction workers expected to migrate into the area: 30.0%

CONSTRUCTION IMPACT FORECAST FOR NAF EL CENTRO CUMULATIVE IMPACTS (2000)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$14,799,000	
Induced:	$10,060,000	
Total:	$24,858,000	(1.590%)
Employment .... Direct:	108	
Total:	374	(0.854%)
Income .... Direct:	$1,799,000	
Total (place of work):	$9,362,000	
Total (place of residence):	$9,362,000	(0.588%)
Local population ....:	131	(0.126%)
Local off-base population ....:	131	
Number of school children ....:	24	
Demand for housing .... Rental:	58	
Owner occupied:	0	
Government expenditures............:	$1,091,000	
Government revenues ....:	$2,063,000	
Net Government revenues ....:	$971,000	
Civilian employees expected to relocate:	58	
Military employees expected to relocate:	0	

CONSTRUCTION CUMULATIVE IMPACTS

Project name: NAF El Centro (2001)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $51,000,000
Local expenditures of project: $20,639,157.19 (calculated)
Percent for labor: 34.2%
Percent for materials: 57.8%
Percent allowed for other: 8.0%
Percent of construction workers expected to migrate into the area: 30.0%

CONSTRUCTION IMPACT FORECAST FOR NAF EL CENTRO CUMULATIVE IMPACTS (2001)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$17,605,000	
Induced:	$11,967,000	
Total:	$29,572,000	(1.891%)
Employment .... Direct:	129	
Total:	445	(1.016%)
Income .... Direct:	$2,140,000	
Total (place of work):	$11,137,000	
Total (place of residence):	$11,137,000	(0.700%)
Local population ....:	155	(0.150%)
Local off-base population ....:	155	
Number of school children ....:	28	
Demand for housing .... Rental:	69	
Owner occupied:	0	
Government expenditures............:	$1,298,000	
Government revenues ....:	$2,454,000	
Net Government revenues ....:	$1,155,000	
Civilian employees expected to relocate:	69	
Military employees expected to relocate:	0	

CONSTRUCTION CUMULATIVE IMPACTS

Project name: NAF El Centro (2002)

Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $28,150,000
Local expenditures of project: $11,392,005.39 (calculated)
Percent for labor: 34.2%
Percent for materials: 57.8%
Percent allowed for other: 8.0%
Percent of construction workers expected to migrate into the area: 30.0%

CONSTRUCTION IMPACT FORECAST FOR NAF EL CENTRO CUMULATIVE IMPACTS (2002)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$9,717,000	
Induced:	$6,606,000	
Total:	$16,323,000	(1.044%)
Employment .... Direct:	71	
Total:	245	(0.561%)
Income .... Direct:	$1,181,000	
Total (place of work):	$6,147,000	
Total (place of residence):	$6,147,000	(0.386%)
Local population ....:	86	(0.083%)
Local off-base population ....:	86	
Number of school children ....:	15	
Demand for housing .... Rental:	38	
Owner occupied:	0	
Government expenditures...........:	$717,000	
Government revenues ....:	$1,354,000	
Net Government revenues ....:	$638,000	
Civilian employees expected to relocate:	38	
Military employees expected to relocate:	0	

CONSTRUCTION CUMULATIVE IMPACTS

Project name: NAF El Centro (2003)

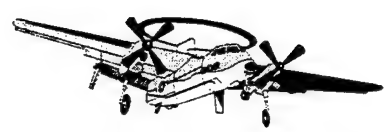
Default price deflators:

baseline year (ex. business volume)	(CPI - 1987)	= 100.0
output and incomes (ex b.v.)	(CPI - 1993)	= 126.3
baseline year (construction)	(ENR-const - 1987)	= 100.0
local expenditures for construction	(ENR-const - 1993)	= 118.2
output and incomes (construction)	(ENR-const - 1993)	= 118.2

If entering total expenditures, enter 1
local expenditures, enter 2 : 1
Dollar volume of construction project: $24,802,000
Local expenditures of project: $10,037,105.42 (calculated)
Percent for labor: 34.2%
Percent for materials: 57.8%
Percent allowed for other: 8.0%
Percent of construction workers expected to migrate into the area: 30.0%

CONSTRUCTION IMPACT FORECAST FOR NAF EL CENTRO CUMULATIVE IMPACTS (2003)

Export income multiplier:	1.6798	
Change in local		
Sales volume .... Direct:	$8,561,000	
Induced:	$5,820,000	
Total:	$14,381,000	(0.920%)
Employment .... Direct:	63	
Total:	216	(0.494%)
Income .... Direct:	$1,041,000	
Total (place of work):	$5,416,000	
Total (place of residence):	$5,416,000	(0.340%)
Local population ....:	76	(0.073%)
Local off-base population ....:	76	
Number of school children ....:	13	
Demand for housing .... Rental:	33	
Owner occupied:	0	
Government expenditures............:	$631,000	
Government revenues ....:	$1,193,000	
Net Government revenues ....:	$562,000	
Civilian employees expected to relocate:	33	
Military employees expected to relocate:	0	



Appendix D. Conformity Determination/Air Quality

Attachments

APPENDIX D
CONFORMITY DETERMINATION/AIR QUALITY

D.1 INTRODUCTION

This appendix contains documentation for the emissions analyses and carbon monoxide dispersion modeling analyses presented in Chapter 4 of the EIS. In addition, this appendix contains: a discussion of Clean Air Act general conformity requirements promulgated by the U.S. Environmental Protection Agency (EPA); a final draft conformity determination for the NAWS Point Mugu Alternative; a draft record of nonapplicability (RONA) for the NAS Lemoore Alternative; and a draft RONA for the NAF El Centro Alternative.

Emissions analyses used for NEPA impact assessment purposes are more comprehensive than those used for general conformity determination purposes. The description of analysis procedures used for different categories of emission sources identifies the types of emission sources excluded from the conformity analysis.

D.2 PROCEDURES USED FOR EMISSION ESTIMATES

D.2.1 Construction Activity

Emission estimates for facility construction activities account for fugitive dust from construction sites plus exhaust emissions from heavy construction equipment. Site disturbance and heavy equipment use will be important only for new construction or facility expansion. Interior building renovations and the interior finishing stage of building construction will have minimal air quality impacts.

All aircraft-related and training-related facilities are scheduled to have a 1998 construction start. Housing facilities and personnel support facilities are scheduled to have a 1999 construction start. As a conservative analysis, all construction emissions were assumed to occur in the construction start year. Any construction

activities carried over into the following year are assumed to be interior finishing work with minimal emissions.

Construction site acreages were estimated from building size estimates, with most structures assumed to be single story construction. Disturbed areas for construction sites were assumed to occupy as much as twice the facility footprint. Table D-1 presents construction site acreage estimates for the three alternatives. The NAWS Point Mugu Alternative would require the least amount of construction, and all of it is scheduled to start in 1998.

Emission estimates for facility construction were developed by splitting the overall construction activity into two phases: site and foundation preparation, and facility construction. The entire construction site was assumed to be disturbed during site and foundation preparation. Only areas outside the facility footprint would be subject to disturbance during the actual building construction phase. Tables D-2 through D-11 present 1998 and 1999 construction emission estimates for each alternative.

Construction emission estimates are based on data and procedures outlined in U.S. Environmental Protection Agency (1985a, 1995). The PM_{10} portion of fugitive dust is estimated as being somewhat less than the silt plus clay fraction of area soils. Additional emission rate adjustments have been made to account for the effectiveness of dust control practices. The resulting fugitive dust PM_{10} emission rate is estimated at 12 pounds per acre-day of construction activity for the NAWS Point Mugu Alternative, 10.8 pounds per acre-day of construction activity for the NAS Lemoore Alternative, and 8 pounds per acre-day of construction activity for the NAF El Centro Alternative. Construction equipment exhaust emission rates are taken from U.S. Environmental Protection Agency (1985b), and are summarized in Table D-12.

D.2.2 E-2 Aircraft Operations

Aircraft emission estimates have been prepared in a manner consistent with data and procedures outlined in U.S. Environmental Protection Agency (1992). To be consistent with normal emission inventory procedures, only emissions released within 3,000 feet of ground level are included in the analysis.

Table D-13 summarizes the expected mixture of annual flight operations by E-2 aircraft. The annual number of flight operations incorporate adjustments for normal deployment rotations of the four E-2 squadrons.

The categories of flight operations used for emissions analyses were developed from data generated by an airfield and airspace utilization model (the naval air simulation model, or NASMOD). The NASMOD report (ATAC Corporation 1997) presents data in two formats: one used for airfield and airspace utilization purposes, and another used as input to noise modeling studies. Neither data format is entirely appropriate for air quality analyses of the E-2 aircraft.

Supplemental information (Huber 1998) clarified that some E-2 takeoffs start with parked aircraft and cold engines while other E-2 takeoffs occur in the course of brief interruptions during FCLP practices.

E-2 aircraft conduct field carrier landing practice (FCLP) patterns by rotating four pilots through a single aircraft, with two pilots on board at any one time. After the first pilot finishes the prescribed number of FCLP cycles, the aircraft lands and taxis to a ramp area. The two pilots then change places and the second pilot takes off to conduct the required number of FCLP cycles. The aircraft lands and taxis to a ramp area again, at which time a second pair of pilots replace the first pair. The FCLP cycles and pilot shifting process are then repeated. The aircraft engine remains at idle during the pilot changes. This method of conducting FCLP practices adds additional taxi, idle, and takeoff operations that must be accounted for in the emissions analysis.

Table D-14 summarizes data used for the analysis of E-2 flight activity emissions. Time-in-mode estimates for takeoffs and landings are EPA default values (U.S. Environmental Protection Agency 1992). The EPA default taxi/idle time for takeoffs is large enough to account for engine idling during preflight checks. Additional taxi/idle and takeoff conditions are listed separately for the pilot swigching process during FCLP practices. Time-in-mode values for pattern events were estimated from analysis of flight track profiles in a recent noise study for NAS Lemoore (Wyle Research 1994). Pattern event profiles at NAS Lemoore are not constrained by the proximity of noise-sensitive urban development or by airspace conflicts with other airports or airfields. Automated carrier landing system (ACLS) patterns were not included in Wyle Research (1994). Based on generalized flight tracks presented in the NASMOD report (ATAC Corporation 1997) the ACLS time-in-mode values were estimated to be twice the duration of FCLP pattern values. Aircraft fuel flow rates are based on Navy data (U.S. Navy 1990). Emission factors are based on Navy data (U.S. Navy 1990) for gaseous pollutants and EPA data (U.S. Environmental Protection Agency 1992) for particulate matter. Table D-15 presents the estimated annual emissions from E-2 aircraft flight operations.

In addition to direct flight operations, there will be emissions associated with engine tests performed after engine maintenance. Emission estimates for these engine run-ups are presented in Table D-16. In-frame engine run-ups are performed when maintenance activities are performed without removing the engine from the aircraft.

When engines are removed for more extensive maintenance, high power run-up tests of E-2 engines will be performed on open engine test stands. Engine test stands require permits from local air pollution control districts, and thus are considered a stationary source excluded from general conformity analyses.

D.2.3 Aircraft Support Equipment

Aircraft operations generally require the use of some specialized ground support equipment. The most common equipment includes tow tractors, portable generators, portable compressors and air conditioning units, portable aircraft engine start units, and hydraulic test stands. Table D-17 summarizes equipment associated with the four E-2 squadrons.

The portable generators, air start units, air conditioning units, and air compressors were used at NAS Miramar during preflight operations to provide power and air conditioning for E-2 aircraft and to start the aircraft engines. The floodlight sets were for standby use during power outages. These items would not be needed for routine preflight operations at NAWS Point Mugu, NAS Lemoore, or NAF El Centro. Each of the realignment alternatives either has or will install fixed point utility systems to provide power and air conditioning for the E-2 aircraft. The generators and compressors used by fixed point utility systems will be stationary sources subject to air pollution control district permit requirements, and thus excluded from Clean Air Act conformity analyses.

The mobile generators, air compressors, air conditioning systems, and air start units will become standby equipment used primarily in the event of problems with the fixed point utility systems or during power outages at aircraft maintenance facilities. The floodlight sets will continue to serve a standby function.

The tow tractors and hydraulic test stands listed in Table D-17 are the major items that will continue to be used routinely to support E-2 flight operations. Based on historical use, large tow tractors are used a cumulative total of 10 hours per week per on-base squadron, and hydraulic test stand equipment is used a cumulative total of 4.5 hours per week per on-base squadron. The equipment use estimates presented in Table D-17 assume that there will be either one or two E-2 squadrons (averaging 1.5 squadrons) deployed at any time. Thus, there will be an average of 2.5 squadrons on-base at any time.

The various generators, compressors, air conditioning units, and air start units noted previously will function primarily as standby units. Nevertheless, they are likely to receive limited use from routine equipment testing and use during power outages. The largest items have engines rated at about 220 horsepower. Annual emissions associated with occasional use of this equipment has been estimated by assuming that 12 such engines are tested or used for one hour each month at a 40% load factor.

Table D-18 presents estimated emissions from tow tractors, hydraulic test stands, and standby equipment. Emission factors used in Table D-18 are based on data for airport service equipment (terminal tractors and other aircraft support equipment) as listed in US Environmental Protection Agency (1991). EPA data for airport service equipment are based primarily on equipment at commercial airports.

Average engine sizes listed in the EPA report are 96 horsepower (hp) for diesel tractors and 82 hp for gasoline tractors. The Navy tow tractors listed in Table D-17 have significantly larger engines than the EPA average (210 hp versus 82 hp for gasoline tow tractors, 164 hp versus 96 hp for diesel tow tractors). In addition, E-2 aircraft are significantly smaller than typical commercial airliners. Consequently, the average operating load factors for the Navy equipment will be significantly less than the average load factors listed in the EPA document. Typical engine sizes and load factors as listed in US Environmental Protection Agency (1991) yield in-use loads of 79 hp for diesel tow tractors, 64 hp for gasoline tow tractors, and 70 hp for other diesel engine aircraft support equipment. Emission estimates presented in Table D-18 have been developed using load factors of 75 percent for hydraulic test stands and 40 percent for other equipment items. The resulting in-use load factors for Navy equipment are consistent with the range of values presented in the EPA document.

D.2.4 Aircraft Refueling

E-2 aircraft use JP-5 or JP-8 aircraft fuel (jet kerosene). The E-2 squadrons are expected to use about 4.1 million gallons of fuel per year. Fuel handling and transfers will result in small quantities of evaporative emissions as liquid fuel displaces air and fuel vapors when fuel tanks are filled (U.S. Environmental Protection Agency 1995). Jet fuel has a low volatility. Consequently, storage and dispensing facilities for jet fuel are exempt from stationary source permit requirements at all three alternative receiving installations. The small quantities of emissions generated during fuel transfer operations are thus included as emissions subject to the EPA general conformity rule.

As indicated in Table D-19, fuel transfer emissions vary with temperature. The emission rates indicated in Table D-19 assume splash loading of fuel tanks. The maximum emissions would occur if aircraft are refueled from fuel trucks rather than from fixed refueling systems. When fuel trucks are used, two fuel transfers are required: filling the tank truck, and fueling the aircraft. To provide a conservative estimate of refueling emissions, refueling from tank trucks is assumed at each alternative receiving installation.

The three alternative receiving installations for the E-2 aircraft experience different seasonal temperature patterns (WeatherDisc Associates 1990). Refueling emission estimates for the NAWS Point Mugu Alternative (Table D-20) assume three months with an average temperature of about 50 degrees Fahrenheit and nine months with an average temperature of about 60 degrees Fahrenheit.

Refueling emission estimates for the NAS Lemoore Alternative (Table D-21) assume one month with an average temperature of 40 degrees Fahrenheit, four months with an average temperature of 50 degrees Fahrenheit, one month with an average temperature of 60 degrees Fahrenheit, four months with an average temperature of 70 degrees Fahrenheit, and two months with an average temperature of 80 degrees Fahrenheit.

Refueling emission estimates for the NAF El Centro Alternative (Table D-22) assume five months with an average temperature of 60 degrees Fahrenheit, one month with an average temperature of 70 degrees Fahrenheit, two months with an average temperature of 80 degrees Fahrenheit, and four months with an average temperature of 90 degrees Fahrenheit.

D.2.5 Paint, Solvent, and Abrasive Use for Aircraft Maintenance

Paints, solvents, and abrasive blasting media used for aircraft and engine maintenance activities will be additional minor sources of emissions associated with E-2 aircraft. Information specific to E-2 aircraft maintenance was not readily available. Information was available from NAS Lemoore that provided generalized paint, solvent, and abrasive blast media use rates on a per-aircraft basis (Castro 1997b). Emission rate estimates (Table D-19) are based on typical solvent content for paints, 100% volatility for solvents, and 1% emissions for abrasive blast media.

Paint, solvent, and abrasive blast media emission estimates are presented in Tables D-20 for the NAWS Point Mugu Alternative, Table D-21 for the NAS Lemoore Alternative, and Table D-22 for the NAF El Centro Alternative. Aircraft and engine maintenance activities will occur in facilities subject to air pollution control district permit requirements. Thus, these emissions are considered stationary source emissions excluded from conformity analyses.

D.2.6 Natural Gas Use for Space and Water Heating

Space heating and water heating requirements for buildings will be met using natural gas as a heating fuel. Data from NAS Lemoore (Castro 1997a) indicate consistent sizes for boiler facilities used in hangars and BEQ/BOQ housing (Table D-19). Boilers in these size ranges require permits from air pollution control districts, and thus are stationary sources excluded from conformity analyses. Natural gas use for family housing, personnel support facilities, and general administrative space has been estimated using generic energy use assumptions derived from data in Hunn (1996).

Emission estimates for natural gas use are presented in Tables D-20 for the NAWS Point Mugu Alternative, Table D-21 for the NAS Lemoore Alternative, and Table D-22 for the NAF El Centro Alternative.

D.2.7 Personal Vehicle Use

Air pollutant emissions associated with personal vehicle travel were estimated by combining appropriate vehicle emission rates and travel pattern estimates. Travel pattern estimates were developed to reflect typical travel patterns for trips from on-base housing versus trips from off-base housing. Vehicle emission rates were calculated using the EMFAC7F vehicle emission rate model (California Air Resources Board 1992, 1993).

The EMFAC Model. EMFAC7F determines vehicle emission rates based on a wide range of factors: pollutants of interest; calendar year; air temperature; mix of vehicle types; vehicle operating mode conditions; average route speed; age distribution of vehicles by type; average annual mileage accumulations by vehicle age and type; basic exhaust emission rates for new vehicles by vehicle type and model year; deterioration rates for exhaust emissions by vehicle type and accumulated mileage; and the effectiveness of vehicle inspection and maintenance programs.

EMFAC7F is designed primarily for use in generating regional and statewide emission inventories rather than for performing project-specific analyses. The model is structured to use state-wide average default values for most input parameters. To provide flexibility for project-specific analyses, standardized EMFAC7F output files provided by the California Air Resources Board (CARB) were placed into a spreadsheet model that performs appropriate unit conversions and composite weightings while allowing the user to vary key parameters of interest. Lookup table data in the spreadsheet version of EMFAC7F are based on 5 mph speed increments and 10 degree temperature increments.

The EMFAC7F program recognizes three operating mode conditions for gasoline-fueled passenger vehicles. These operating modes (cold start, hot start, and hot stabilized) are a function of four factors: how long a vehicle's engine has been on; how long the vehicle was parked before the engine was started; the operating mode condition of the vehicle at the time it was previously parked; and whether the vehicle has a catalytic converter. Vehicles operating in a cold start mode have significantly higher emission rates than those operating in hot start or hot stabilized modes.

Vehicle Operating Modes. Vehicle operating mode definitions reflect the conditions of standardized test procedures used to certify that new vehicles meet applicable federal and state emission standards. By definition, the hot stabilized mode represents all vehicle operations occurring after the engine has been on for 505 seconds. The first 505 seconds of vehicle operation will be in either a cold start or a hot start mode. Cold start and hot start operating modes are distinguished by three factors: the operating mode condition of the vehicle when parked; the duration of parking preceding vehicle start-up; and the presence or absence of a catalytic converter.

Vehicles with a catalytic converter will resume operations in a cold start mode after the engine has been off for 1 hour or more. Vehicles without a catalytic converter resume operations in a cold start mode after the engine has been off for 4 hours or more. Any vehicle which is still in a cold start mode when parked will resume operations in a cold start mode regardless of the parking duration.

If a catalyst-equipped vehicle is parked for less than 1 hour, it will resume operations in a hot start mode (unless the vehicle was still in a cold start mode

when it parked). If a noncatalyst vehicle is parked for a period of less than 4 hours, it will resume operations in a hot start mode.

Parking duration patterns vary by trip purpose. Work trips often begin in a cold start mode and end with a long parking duration. Shopping trips are more likely to begin in a hot start mode and end with a short or intermediate parking duration. Typical cold start and hot start patterns by trip type have been developed by the California Department of Transportation (Caltrans) using data from statewide travel pattern surveys (California Department of Transportation 1981).

Average vehicle operating mode conditions can be calculated directly from a known or assumed travel time distribution. Travel time distribution assumptions are most easily established by separating overall vehicle travel into trip purpose categories that can be associated with residential and nonresidential land use categories. Three trip categories (home-work trips, home-shopping trips, home-other trips) are normally used for residential land uses. Two additional trip categories (other-work and other-other) are typically added for nonresidential land uses.

Travel Patterns. The analyses used for this EIS were developed separately for on-base and off-base housing. Travel patterns associated with off-base housing were evaluated in greater detail than those associated with on-base housing.

A single generic travel time distribution pattern was use for on-base housing at each alternative (Table D-23). Vehicle emission rates for trips from on-base housing were prepared separately for each alternative, since summer temperature patterns differ significantly among the alternative receiving installation. Differences in diurnal temperature patterns affect both exhaust and evaporative emissions from motor vehicles. EMFAC7F input assumptions and resulting emission rates for trips from on-base housing are presented in Tables D-24 and D-25 for the NAWS Point Mugu Alternative, in Tables D-26 and D-27 for the NAS Lemoore Alternative, and in Tables D-28 and D-29 for the NAF El Centro Alternative.

Separate travel time distribution patterns were developed for trips associated with off-base housing for each alternative (Tables D-30, D-31, and D-32 for NAWS Point Mugu, NAS Lemoore, and NAF El Centro, respectively). The travel time patterns were developed by considering the locations of various residential communities likely to provide off-base housing for E-2 personnel, roadway networks between these communities and the base, and typical travel times along the various road networks. The mean work trip travel times produced by this analysis are somewhat shorter than the average commute times presented in published summaries of travel survey data (U.S. Federal Highway Administration 1985; California Department of Transportation 1992). Military personnel are

likely to seek housing locations that provide reasonable proximity to both jobs and services available on-base.

EMFAC7F input assumptions and resulting emission rates for trips from off-base housing are presented in Tables D-33 and D-34 for the NAWS Point Mugu Alternative, in Tables D-35 and D-36 for the NAS Lemoore Alternative, and in Tables D-37 and D-38 for the NAF El Centro Alternative.

Emission Estimates. Travel time distributions and associated vehicle emission factors were converted into overall emission estimates by establishing vehicle trip generation rates and vehicle speed distribution patterns by trip purpose and on-base versus off-base housing situation. Different speed distributions were used at each alternative receiving installation for work trips from on-base housing, thus converting the generic travel time pattern into different average trip distance values.

Tables D-39 and D-40 summarize the vehicle emissions analysis for the NAWS Point Mugu Alternative. Tables D-41 and D-42 summarize the analysis for the NAS Lemoore Alternative. Tables D-43 and D-44 summarize the analysis for the NAF El Centro Alternative. Vehicle emissions have been separated into two components: emissions associated with base-related travel (work-related trips), and emissions associated with other household travel (shopping and other trips). Base-related emissions are included in conformity analyses. Emissions from other household travel are considered in the overall air quality impact analysis, but are excluded from consideration in the conformity analysis.

Trip generation rates presented in Tables D-39, D-41, and D-43 are based on adjustments made to standardized trip generation rates. The adjustments made to standardized trip generation rates maintain consistency with assumptions used in the traffic impact analyses presented in the EIS. About 683 of the added personnel will be periodically deployed to aircraft carriers. As an annual average, about 37.5 percent of these personnel will be away from the base on sea duty at any given time, and will thus not be making any vehicle trips. Additional adjustments presented in Tables D-39, D-41, and D-43 account for nonvehicular travel ridesharing, or transit use.

The EMFAC7F model does not estimate sulfur oxide emissions from motor vehicles. Sulfur oxide emissions have been estimated using a generalized emission factor of 0.03 grams per vehicle-mile (Bay Area Air Quality Management District 1996). The EMFAC7F model also does not estimate PM_{10} emissions generated as resuspended roadway dust. A generalized resuspended PM_{10} emission rate of 2.9 grams per vmt (vehicle miles traveled) has been added to the exhaust and tire wear PM_{10} emission rates provided by the EMFAC7F model. The resuspended PM_{10} emission factor was calculated from U.S. Environmental Protection Agency (1985a) as a weighted average of values for local streets (10% of vmt), collector streets (20% of vmt), major arterials (25% of vmt), and freeways (45% of vmt).

D.2.8 Government Vehicle Use

Government vehicle fleets at military bases are typically dominated by pick-up trucks, sport utility vehicles, and vans. Heavy duty trucks, sedans, and some buses constitute the remainder of the government-owned vehicle fleet. Much of the government-owned vehicle fleet is used for base security and base maintenance activities, with most vehicle operation occurring on-base. Personnel and equipment transportation generates a mixture of on-base and off-base travel. Overall travel patterns for government-owned vehicles will normally be dominated by on-base use. Table D-45 presents a generic government vehicle travel time pattern that provides reasonable estimates of use patterns for all three alternatives.

Tables D-46 and D-47 present 1999 emission rates for government-owned vehicles at temperature patterns experienced in the NAWS Point Mugu area. Tables D-48 and D-49 present 1999 emission rates for government-owned vehicles at temperature patterns experienced in the NAS Lemoore area. Tables D-50 and D-51 present 1999 emission rates for government-owned vehicles at temperature patterns experienced in the NAF El Centro area.

Compared to personal vehicle types, government-owned vehicle fleets have somewhat higher nitrogen oxide and PM_{10} emission rates and somewhat lower carbon monoxide emission rates. The greatest difference between personal vehicles and government vehicle fleets is in nitrogen oxide emissions, where the high truck fraction of government vehicle fleets results in nitrogen oxide emission rates about twice those of personal vehicles. Table D-52 summarizes composite emission rates for government vehicle fleets at NAWS Point Mugu, NAS Lemoore, and NAF El Centro. The differences in emission factors among these locations are due primarily to differences in seasonal temperature patterns.

The arrival of personnel associated with the four E-2 squadrons will result in a small increase in the use of government-owned vehicles. Eighteen additional vehicles are expected to be provided to support the E-2 squadrons. In addition to the use of those vehicles, the E-2 squadrons may generate increased use of existing government-owned vehicles at the receiving installation.

Historical data from NAWS Point Mugu (presented subsequently in Table D-67) show an average government vehicle use factor of 19.5 miles per work day per vehicle. The associated annual vmt factor (4,681 miles per year per vehicle) has been used to estimate the additional emissions associated with government vehicle use by E-2 personnel.

Table D-53 summarizes the estimated distribution of travel time and vmt among different average travel speed categories for on-base and off-base use of government vehicles. Table D-54 presents the estimated vmt and resulting emissions for E-2 related increases in government vehicle use at each of the three alternative receiving installations.

D.3 DATA FOR CARBON MONOXIDE DISPERSION MODELING

State and federal vehicle emission controls have eliminated violations of carbon monoxide standards from most urban areas in California. The potential for carbon monoxide problems is greatest at locations experiencing severe traffic congestion. Traffic analyses prepared for this EIS indicate no significant impacts from traffic associated with added personnel at any of the three alternative receiving installations. Consequently, carbon monoxide dispersion modeling analyses were preformed for limited roadway networks at the major access gates for each alternative. The CALINE4 model (Benson 1989) was used for all dispersion modeling analyses. Afternoon peak hour traffic conditions were modeled and then extrapolated to potential 8-hour average conditions.

Dispersion modeling for NAWS Point Mugu included Highway 1, the frontage road, North Mugu Road, Main Road, and Las Posas Road. Dispersion modeling for NAS Lemoore included State Route 198 and the main access road. Dispersion modeling for NAF El Centro included Evan Hewes Road and Forrester Road. Modeled receptor locations were 75 feet from the major intersection of interest.

The EMFAC7F vehicle emission rate program (California Air Resources Board 1992, 1993) was used to estimate carbon monoxide emission rates for vehicles operating on roadways in the study area. The equations used in the vehicle emission rate models incorporate coefficients representing speed-dependent patterns of vehicle idling, acceleration, cruising, and deceleration. The resulting vehicle emission rates do not represent a constant speed cruise condition. Instead, they represent a pattern of speed changes representing an overall average route speed. The amount of idling time inherent in the emission rate models increases from about 2 percent of travel time at 55 mph to 10 percent at 30 mph and to 48 percent at 5 mph (Smith and Aldrich 1977; Sculley 1989). This inherent pattern adequately accounts for congestion-related idling on most roadways that do not experience significant congestion or signalization delays.

The amount of vehicle idling occurring at congested or signalized intersections can exceed the amount of idling inherent in the vehicle emission rate models, even if low intersection approach speeds are assumed. To more adequately account for the amount of idling at congested intersections, special adjustments were made to the basic EMFAC7F emission rates for roadway links at the major intersection of interest.

The basic idle adjustment procedure uses the length of a modeled roadway link and the assumed average vehicle speed to determine the amount of idling time inherent in the associated EMFAC7F emission rate. This idling time value can then be compared to an estimate of expected actual delay time per vehicle (based on intersection delay analyses, level-of-service estimates, or signal cycle times). When the expected actual delay per vehicle exceeds the idling time accounted for in the vehicle emission rates, an excess idling emission rate increment can be calculated and added to the basic EMFAC7F rate.

Table D-55 presents generic idling adjustment analyses use for the CALINE4 modeling. Idling delays of 20 seconds per vehicle were assumed for NAWS Point Mugu and NAS Lemoore. An idling delay of 25 seconds was assumed for the NAF El Centro analysis.

The CALINE4 model was run using an averaging time of 60 minutes and a surface roughness factor of 50 centimeters. No settling or deposition velocities were used. A scale factor of 0.3048 was used to convert link and receptor coordinate units from feet to meters. All CALINE4 runs assumed a wind speed of 1.0 meters per second (2.2 mph), stable atmospheric conditions (stability class E and a horizontal wind direction fluctuation parameter of 10 degrees), and a mixing height limit of 50 meters (164 feet). Wind directions were varied in 10 degree increments to identify the situation producing the highest total pollutant concentration at each receptor location.

Actual CALINE4 input files are presented in Table D-56 (NAWS Point Mugu), Table D-57 (NAS Lemoore), and Table D-58 (NAF El Centro).

D.4 PRELIMINARY EMISSION ESTIMATES FOR CUMULATIVE IMPACT SCENARIOS AT NAS LEMOORE AND NAF EL CENTRO

Cumulative development projects identified for the three alternative receiving installations include some on-base construction activities and various urban developments planned for areas surrounding the different bases. In addition, two of the three alternative receiving installations (NAS Lemoore and NAF El Centro) are being considered as receiving installations for the introduction of F/A-18E/F aircraft on the West Coast.

The on-base construction projects would be temporary sources of construction emissions, with some activity being concurrent with construction projects supporting the E-2 aircraft. Traffic associated with urban development projects would contribute cumulatively to regional emissions of ozone precursors, but would have only minimal cumulative contributions to carbon monoxide levels along roadways near the various bases. No quantitative estimates have been made for emissions associated with these various development projects.

The introduction of F/A-18E/F aircraft to the West Coast is the subject of a separate EIS (U.S. Navy 1997b). NAS Lemoore is identified as the preferred alternative for that action, with NAF El Centro identified as an alternative receiving installation. At one time, NAWS Point Mugu was considered as an alternative for the F/A-18E/F aircraft. NAWS Point Mugu was eliminated as an F/A-18E/F alternative because the base did not meet screening criteria for operational requirements.

F/A-18 E/F aircraft arrivals would occur in two phases. An initial phase of squadron arrivals and training would occur between 1999 and 2003, resulting in a maximum of 92 additional aircraft at the receiving installation during that time

period. A second phase of squadron arrivals and training (72 aircraft) would occur after 2005. These second phase of F/A-18E/F aircraft arrivals would be one-for-one replacements for existing NAS Lemoore F/A-18C/D aircraft.

Phase 1 of the F/A-18E/F action would increase the number of aircraft assigned to the chosen receiving installation by 92 aircraft. If NAS Lemoore is chosen as the F/A-18E/F receiving installation, Phase 2 would be accompanied by a slight reduction in total based aircraft at NAS Lemoore as an existing F/A-18C/D training squadron is reduced in size as other squadrons transition from F/A-18C/D aircraft to F/A-18E/F aircraft. If NAF El Centro is chosen as the F/A-18E/F receiving installation, Phase 2 of the action would increase the number of added aircraft from 92 to 164.

D.4.1 NAS Lemoore Alternative

The NAS Lemoore Alternative for the F/A-18 action would require some new facility construction: new and expansion of training facilities; new and expanded aircraft maintenance facilities; additional personnel support facilities; and new on-base housing facilities. Most construction activity would occur after completion of construction projects that support the E-2 aircraft. Air quality permits would probably be required any new central boilers for new or expanded facilities. Permits might also be required for various types of equipment, such as generators, compressors, degreasing tanks, painting facilities, etc.

Traffic associated with F/A-18 E/F personnel and their dependents would contribute cumulatively to regional emissions of ozone and PM_{10} precursors. This traffic would also add somewhat to carbon monoxide levels along roadways near NAS Lemoore, but would not result in any violations of state or federal carbon monoxide standards.

Completion of the first phase of F/A-18 E/F squadron arrivals would add about 87,400 additional flight operations per year at NAS Lemoore. The second phase of F/A-18E/F squadron arrivals would not result in additional fight operations, since the Phase 2 aircraft would be one-for-one replacements of F/A-18C/D aircraft already stationed at NAS Lemoore. Overall flight operations at NAS Lemoore would probably decline slightly after 2005 as an existing F/A-18C/D training squadron is reduced in size.

Table D-59 summarizes preliminary emission estimates for the F/A-18E/F action under the NAS Lemoore Alternative. Emissions associated with the F/A-18 E/F action would exceed the Clean Air Act conformity rule de minimis thresholds for the San Joaquin Valley, thus requiring a Clean Air Act conformity determination. Compensating emission reductions associated with the recent closure of Castle Air Force Base are expected to provide the required demonstration of Clean Air Act conformity. The Final EIS for the F/A-18E/F action should be consulted for additional details.

D.4.2 NAF El Centro Alternative

The NAF El Centro Alternative for the F/A-18E/F action would require significant new facility construction during Phase 1 of the introduction: a new parallel runway and associated facilities; new hangar space and expansion of training facilities; a new engine test cell and power check pad; new aircraft maintenance facilities; additional personnel support facilities; and new on-base housing facilities.

Most construction activity would occur after completion of construction projects that support the E-2 aircraft. Air quality permits would be required for the engine test cell and any new central boilers for new or expanded facilities. Permits might also be required for various types of equipment, such as generators, compressors, degreasing tanks, painting facilities, etc.

Traffic associated with F/A-18 E/F personnel and their dependents would contribute cumulatively to regional emissions of ozone and PM_{10} precursors. This traffic would also add somewhat to carbon monoxide levels along roadways near NAF El Centro, but would not result in any violations of state or federal carbon monoxide standards.

If based at NAF El Centro, completion of the first phase of F/A-18 E/F squadron arrivals would generate an additional 87,400 additional flight operations per year. Completion of the second phase of F/A-18E/F squadron arrivals would increase annual F/A-18E/F flight operations to 113,486 per year.

Table D-60 summarizes preliminary emission estimates for the F/A-18E/F action under the NAF El Centro Alternative. Emissions associated with the F/A-18 E/F action would exceed the Clean Air Act conformity rule de minimis thresholds for Imperial County, thus requiring a Clean Air Act conformity determination. The conformity determination process would have to compensate for the increase in ozone precursor emissions by arranging for compensating emission reductions from other emission sources in the air basin, or having the Air Pollution Control District revise the SIP document to account for the increased emissions at NAF El Centro. The Final EIS for the F/A-18E/F action should be consulted for additional details.

D.5 CLEAN AIR ACT CONFORMITY REQUIREMENTS

D.5.1 Introduction

Section 176(c) of the Clean Air Act requires that federal agency actions be consistent with the Clean Air Act and with any approved air quality management plan (state implementation plan [SIP]). EPA adopted Clean Air Act conformity requirements in two stages: one rule for regional transportation plans, highway projects, and transit projects; and a second rule for other federal agency actions.

The conformity rule for highway and mass transit plans and projects was promulgated in the November 24, 1993 Federal Register (58 FR 62188-62216). The transportation conformity rule (40 CFR Part 93 Subpart A; duplicated in 40 CFR Part 51 Subpart T) applies to transportation plans and transportation projects that require action by the Federal Highway Administration (FHWA) or the Federal Transit Administration (FTA) under Title 23 U.S.C. or the Federal Transit Act. The transportation conformity rule defines a "transportation project" as a highway project or mass transit project. Federal agency actions affecting airports, harbors, or freight rail facilities would normally be subject to the general conformity rule, not the transportation conformity rule.

The conformity rule for general federal actions was promulgated in the November 30, 1993 Federal Register (58 FR 63214-63259), and became effective on January 31, 1994. The Navy's proposed realignment action is subject to the general conformity rule (40 CFR Part 93 Subpart B; duplicated in 40 CFR Part 51 Subpart W).

D.5.2 Purpose of the General Conformity Rule

The EPA general conformity rule requires federal agencies to analyze proposed actions according to standardized procedures and to provide a public review and comment process. The conformity determination process is intended to demonstrate that the proposed federal action:

- Will not cause or contribute to new violations of federal air quality standards;
- Will not increase the frequency or severity of existing violations of federal air quality standards; and
- Will not delay the timely attainment of federal air quality standards.

D.5.3 Applicability of the General Conformity Rule

The EPA general conformity rule applies to general federal actions affecting nonattainment areas and to designated maintenance areas (attainment areas that have been reclassified from a previous nonattainment status and which are required to prepare an air quality maintenance plan). Conformity requirements apply only to nonattainment and maintenance pollutants. Emissions of attainment pollutants are exempt from conformity analyses.

Analyses required by the general conformity rule focus on the net increase in emissions compared to ongoing historical conditions. Existing SIPs are presumed to have accounted for routine, ongoing federal agency activities. Conformity analyses are further limited to those direct and indirect emissions over which the federal agency has responsibility and control. General conformity analyses are not required to analyze emission sources that are beyond the responsibility and control of the federal agency. Conformity determinations are not required to address emissions that are not reasonably foreseeable or reasonably quantifiable.

Highway or mass transit projects that require FHWA or FTA funding or approval will be subject to transportation conformity rule requirements rather than the EPA general conformity rule requirements. Five additional categories of actions and projects also are excluded from the general conformity rule requirements (40 CFR 93.153(d); 40 CFR 51.853(d)):

- Stationary sources requiring new source review (NSR) or prevention of significant deterioration (PSD) permits;
- Direct emissions from remedial actions at Superfund (CERCLA) sites when the substantive requirements of NSR/PSD programs are met or when the action is otherwise exempted under provisions of CERCLA;
- Initial and continuing actions in response to emergencies or disasters;
- Alterations and additions to existing structures as specifically required by applicable environmental legislation or regulations; and
- Various special studies and research investigation actions.

In addition, conformity determinations are not required when the annual direct and indirect emissions from the action will be less than the applicable "de minimis" thresholds (40 CFR 93.153(c)(1); 40 CFR 51.853(c)(1)). Applicable de mimimis levels vary by pollutant and the severity of nonattainment conditions (40 CFR 93.153(b); 40 CFR 51.853(b)). The de minimis thresholds in carbon monoxide, sulfur dioxide, or nitrogen dioxide nonattainment areas are 100 tons per year of the relevant pollutant. The de minimis threshold in lead nonattainment areas is 25 tons per year.

The de minimis threshold in ozone nonattainment areas applies separately to both organic compound and nitrogen oxide emissions. The de minimis level varies according to severity of nonattainment: 100 tons per year in marginal or moderate nonattainment areas, 50 tons per year in serious nonattainment areas, 25 tons per year in severe nonattainment areas, and 10 tons per year in extreme nonattainment areas.

The de minimis threshold in PM_{10} nonattainment areas applies separately to identified PM_{10} precursors as well as to directly emitted PM_{10}. The de minimis level is 100 tons per year in moderate nonattainment areas and 70 tons per year in severe nonattainment areas.

The EPA conformity rule (40 CFR 93.153(c)(2); 40 CFR 51.853(c)(2)) identifies several categories of actions that are presumed to result in no net emissions increase or in an emissions increase that will clearly be less than any applicable de minimis level. These types of activities are primarily routine administrative, planning, financial, property disposal, or property maintenance actions.

Regardless of the applicable de minimis level, conformity assessments are required for non-exempt "regionally significant" actions: direct and indirect emissions exceed 10% of the applicable SIP emissions inventory, regardless of numerical value.

Emission estimates summarized in Chapter 4 of the EIS and documented in subsequent sections of this appendix demonstrate that Clean Air Act conformity determination requirements apply to the NAWS Point Mugu Alternative. The NAS Alternative and the NAF El Centro Alternative would have total conformity-related emissions that are below the relevant de minimis thresholds. These alternatives would qualify for a Record of Nonapplicability (RONA).

D.5.4 Responsibility for Conformity Determinations

The federal agency undertaking the action is responsible for preparing and issuing the conformity determination under the EPA conformity rules. Other federal, state, and local agencies have review and comment responsibility, but no agency has approval/denial authority over the conformity determination.

D.5.5 Options for Demonstrating Conformity

Two types of technical analyses can be used to demonstrate clean air act conformity:

- Dispersion modeling demonstrations for primary (i.e., directly emitted) pollutants to show that there will be no violations of federal ambient air quality standards; or
- Emissions analyses that demonstrate that there will be no net emissions increase and that emissions will not interfere with the timely attainment and maintenance of federal ambient air quality standards.

Dispersion modeling demonstrations of conformity are not allowed for ozone nonattainment areas, and will seldom be feasible for other secondary pollutants (nitrogen dioxide and particulate matter). In addition, modeling may not be possible for some types of emission sources due to the lack of appropriate dispersion models. In general, dispersion modeling is most useful for carbon monoxide, lead, and sulfur dioxide nonattainment areas. Dispersion modeling may be useful in some PM_{10} nonattainment areas if secondary PM_{10} is not a significant contributor to nonattainment conditions.

If dispersion modeling is not used for the conformity demonstration, then the conformity demonstration requires either consistency with emission forecasts in SIP documents or identification of concurrent or prior emission reductions that will compensate for emission increases associated with a proposed action.

If EPA has not yet approved a SIP document submitted pursuant to the Clean Air Act Amendments of 1990, there are two basic options for demonstrating conformity.

- Conformity will be demonstrated if direct and indirect emissions from the action are fully offset through compensating emission reductions implemented through a federally enforceable mechanism (40 CFR 93.158(a)(2); 40 CFR 51.858(a)(2)).
- Alternatively, conformity can be demonstrated by showing that total direct and indirect emissions with the federal action do not exceed estimated future baseline scenario emissions. Future baseline scenario emissions are total direct and indirect emissions that would occur in future years if baseline (1990 or the nonattainment designation year) emission source activity levels remain constant in the geographic area affected by the federal action. The future baseline scenario represents a "no action" scenario projected to the maximum emissions year for the proposed action, to the attainment year mandated by the Clean Air Act, and to any other "milestone" years identified in the existing SIP (40 CFR 93.158(a)(5)(iv)(A); 40 CFR 51.858(a)(5)(iv)(A)).

If EPA has approved SIP revisions pursuant to the 1990 Clean Air Act Amendments, any one of several options can be used for demonstrating conformity.

- Conformity is presumed if direct and indirect emissions from the activity are specifically identified and accounted for in the attainment or maintenance demonstration of a SIP approved after 1990 (40 CFR 93.158(a)(1); 40 CFR 51.858(a)(1)).
- Conformity will be demonstrated if direct and indirect emissions from the action are fully offset through compensating emission reductions implemented through a federally enforceable mechanism (40 CFR 93.158(a)(2) and 40 CFR 93.158(a)(5)(iii); 40 CFR 51.858(a)(2) and 40 CFR 51.858(a)(5)(iii)).
- Conformity also can be demonstrated if the agency responsible for SIP preparation provides documentation that direct and indirect emissions associated with the federal agency action are accommodated within the emission forecasts contained in an approved SIP (40 CFR 93.158(a)(5)(i)(A); 40 CFR 51.858(a)(5)(i)(A)).
- Finally, if SIP conformity cannot be demonstrated by the procedures noted above, a conformity determination is possible only if the relevant air quality management agency notifies EPA that appropriate changes will be made in the applicable SIP documents. The air quality management agency must commit to a schedule for preparing an acceptable SIP amendment that accommodates the net increase in

direct and indirect emissions from the federal action without causing any delay in the schedule for attaining the relevant federal ambient air quality standard (40 CFR 93.158(a)(5)(i)(B); 40 CFR 51.858(a)(5)(i)(B)).

All conformity determinations must also demonstrate that total direct and indirect emissions are consistent with all relevant requirements and milestones in the applicable SIP including:

- Reasonable further progress schedules,
- Assumptions specified in the attainment or maintenance demonstration, and
- SIP prohibitions, numerical emission limits, and work practice requirements.

D.6 FINAL DRAFT CLEAN AIR ACT CONFORMITY DETERMINATION, REALIGNMENT OF E-2 SQUADRONS FROM NAS MIRAMAR TO NAWS POINT MUGU

D.6.1 Applicability Analysis

NAWS Point Mugu is located in Ventura County, California. Most of Ventura County (including NAWS Point Mugu) is designated a severe ozone nonattainment area. As indicated subsequently in Table D-61, direct and indirect emissions of nitrogen oxides associated with the E-2 realignment exceed the de minimis threshold of 25 tons per year for ozone precursors. Consequently, Clean Air Act conformity determination requirements apply to the E-2 realignment action.

Some emission sources associated with the E-2 realignment action are exempt from consideration under the general conformity rule. Exempt emission sources include stationary sources that require permits from the Ventura County Air Pollution Control District (VCAPCD) and emission sources that are not under Navy control.

Because NAWS Point Mugu already has most facilities required to support the E-2 realignment, relatively few new facilities will be constructed. In some cases, facilities that currently have permits from the VCAPCD may require modifications. Existing engine test stands and existing aircraft maintenance facilities are the facilities most likely to require amendments to existing permits. NAWS Point Mugu Environmental Division staff have identified only one existing permit (for abrasive blasting, cleaning, and coating operations) that may require modification to accommodate the E-2 realignment action. Facilities covered by existing, amended, or new VCAPCD permits are exempt from consideration in a conformity determination.

Portable equipment associated with aircraft maintenance and flight operation activities is potentially subject to VCAPCD permit requirements. For most of

this equipment, however, the Navy has the option of state registration (under Health and Safety Code sections 41750-41755) instead of having it permitted as a stationary source. State-registered portable equipment is not subject to new source review requirements, and thus must be considered in conformity analyses. For purposes of this conformity determination, all such equipment has been treated as permit-exempt portable or mobile source equipment, and included in the conformity analysis.

Vehicle travel associated with added military and civilian personnel has been separated into base-related travel (work-related trips) and other household travel (shopping and other nonwork trips). Emissions associated with base-related travel are included in the conformity analysis. Emissions associated with increased use of government-owned vehicles are also included in the conformity analysis.

Emissions associated with shopping and other household travel (including work trips by spouses employed elsewhere) are not under Navy control, and thus are excluded from the conformity analysis. Additionally, emissions associated with off-base housing units (space heating, water heating, etc.) are not under Navy control, and are excluded from the conformity analysis.

D.6.2 Summary of Added Emissions

Conformity-related emission estimates for the E-2 realignment action are summarized in Table D-61. The maximum annual conformity-related emissions will be 12.19 tons per year of reactive organic compounds and 31.59 tons per year of nitrogen oxides. These emission quantities will decline slightly after 1999 because construction activities will be complete and emissions from motor vehicles will continue to decline slightly each year. For simplicity, this conformity analysis assumes that conformity-related emissions from the E-2 realignment action remain constant after the year 1999.

D.6.3 Post-1990 Emission Reductions at NAWS Point Mugu

The Ventura County ozone SIP forecasts continuing growth in activity indexes for most emission source categories. Emission reductions presented in the SIP emission forecasts are achieved primarily through continuing or new emission control programs, rather than by forecasting reductions in underlying source activity levels.

The government aircraft category included in the Ventura County ozone SIP is expressly identified as flight operations based at NAWS Point Mugu (Ventura County Air Pollution Control District 1994c). Other stationary, mobile, and area emission sources associated with NAWS Point Mugu are incorporated into the SIP emission forecasts as inherent components of county-wide emission categories such as industrial, commercial, and residential fuel combustion; degreasing operations; surface coating operations; on-road motor vehicle travel; entrained dust from paved roadways; and small utility engine equipment operations.

Table D-62 summarizes some of the county-wide growth factors used in the Ventura County ozone SIP to forecast emission changes for various stationary, mobile, and area sources. The growth factors included in Table D-62 are those most relevant to emission sources at NAWS Point Mugu. The no growth and military aircraft indexes were projected to remain constant, but all other indexes anticipate continued growth. While the county-wide growth factors do not distinguish between growth of existing emission sources and establishment of new emission sources, they also provide no indication that emission reductions were anticipated for NAWS Point Mugu in the 1994 Ventura County ozone SIP.

In reality, there were significant reductions in aircraft activity at NAWS Point Mugu between 1990 and 1996. Personnel reductions and reduced activity at various stationary and area emission sources occurred concurrently with the reductions in aircraft activity. The reductions in aircraft and personnel have resulted in emission reductions from a wide range of mobile and stationary sources at NAWS Point Mugu. Table D-63 summarizes the identifiable emission changes that occurred at NAWS Point Mugu between 1990 and 1996. As can be seen from Table D-63, almost all emission source categories at NAWS Point Mugu show reductions in emissions between 1990 and 1996.

As indicated in Table D-63, the overall change in conformity-related emissions at NAWS Point Mugu between 1990 and 1996 amounts to a reduction of 32.13 tons per year in reactive organic compound emissions and a reduction of 39.48 tons per year in nitrogen oxide emissions. These post-1990 emission reductions at NAWS Point Mugu exceed the conformity-related emission increases (12.19 tons per year for reactive organic compounds and 31.59 tons per year of nitrogen oxides) that will be generated by the E-2 realignment action. By themselves, the emission reductions for government aircraft (28.28 tons per year of reactive organic compounds and 36.21 tons per year of nitrogen oxides) exceed all conformity-related emission increases associated with the E-2 action.

The following discussion provides additional details concerning emission estimates presented in Table D-63.

Aircraft Operations. The 1994 ozone SIP for Ventura County uses 1990 as a base year. Aircraft flight operations for NAWS Point Mugu are discretely identified in the ozone SIP. Most flight operations are categorized as government aircraft. A few NAWS Point Mugu flight operations are identified as general aviation aircraft flights between NAWS Point Mugu and San Nicolas Island. Table D-64 summarizes the emission estimates for NAWS Point Mugu aircraft operations as presented in the 1994 ozone SIP.

Emission forecasts in the ozone SIP assume a continuation of 1990 conditions for government aircraft operations based in Ventura county. In reality, the number of aircraft and personnel assigned to NAWS Point Mugu have been reduced since 1990. NAWS Point Mugu Environmental Division staff have identified 67 aircraft

that no longer operate from NAWS Point Mugu (Table D-65). These aircraft accounted for over one-half of all flight operations at NAWS Point Mugu during 1990.

Aircraft additions and changes in flight activity for remaining aircraft have introduced other changes in overall aircraft operations at NAWS Point Mugu. Table D-66 summarizes aircraft flight activity and emission estimates developed by NAWS Point Mugu staff for 1996 conditions. The emission estimates presented in Table D-66 were developed in a manner consistent with procedures and data sources used in the 1994 ozone SIP. Aircraft flight operation changes at NAWS Point Mugu between 1990 and 1996 account for emission reductions of 28.28 tons per year for reactive organic compounds and 36.21 tons per year for nitrogen oxides.

Personal Vehicle Work Trips. Section 3.4.1 of the EIS text indicates that the existing workforce at NAWS Point Mugu (military, civilian, and contractor personnel) is 8,167. Workforce reductions at NAWS Point Mugu between 1990 and 1996 amounted to 720 positions (Section 3.4.1 of the EIS text). Thus, the 1990 workforce for NAWS Point Mugu is estimated to have been 8,887. The 1999 emission estimates of E-2 personnel (996 positions) were used to extrapolate personal vehicle work trip emissions for the 1990 and 1996 NAWS Point Mugu workforce levels. The use of 1999 calendar year vehicle emission factors in this analysis procedure avoids the confounding effects of vehicle model year turnover and resulting changes in per-vehicle emission factors. Consequently, the 1990 - 1996 change in personal vehicle work trip emissions shown on Table D-63 reflects the change in workforce levels, not the effect of state vehicle emission control programs.

Government Vehicle Use. Table D-67 summarizes data from NAWS Point Mugu government vehicle odometer records for 1990 to 1997. The number of government vehicles at NAWS Point Mugu increased slowly between 1992 and 1997, but overall vehicle use fluctuated with little overall trend until 1996. Overall vehicle use for 1996 and 1997 was lower than average usage during the 1990-1995 period. Changes in government vehicle use appears to be tied to changing operational conditions at the base rather than to changing workforce levels. Table D-68 presents the estimated change in NAWS Point Mugu government vehicle emissions between 1990 and 1996, using 1999 calendar year emission rates presented previously in Table D-52. The use of 1999 calendar year vehicle emission factors in this analysis procedure avoids the confounding effects of vehicle model year turnover and resulting changes in per-vehicle emission factors. Consequently, the 1990 - 1996 change in government vehicle emissions shown on Table D-63 reflects the change in vehicle use, not the effect of state vehicle emission control programs.

The government vehicle emissions analysis presented in Table D-67 does not account for vehicle fuel conversions that occurred between 1993 and 1996. During

that time, 15 of 33 sedans and 63 of 307 light and medium duty trucks were converted from gasoline to compressed natural gas (CNG) or dual fuel vehicles. Thus, the government vehicle emission reductions presented in Table D-63 are somewhat underestimated.

Other Emission Sources. NAWS Point Mugu Environmental Division staff analyses (U.S. Navy 1997d) provided emission estimates for the source categories not discussed above. Most emission estimates are based on operational logs or fuel use records, and reflect data provided in annual reports to the Ventura County Air Pollution Control District.

D.6.4 Statement of Conformity

Post-1990 activity reductions at NAWS Point Mugu are not reflected in the emission forecasts used in the 1994 ozone SIP for Ventura County. Thus, actual emission reductions at NAWS Point Mugu between 1990 and 1996 can be considered surplus emission reductions that have not already been used in the SIP for demonstrating attainment of the federal ozone standard. Since actual post-1990 emission reductions at NAWS Point Mugu exceed the additional emissions associated with the E-2 realignment action, emissions at NAWS Point Mugu will remain within the emission budgets contained in the 1994 ozone SIP for Ventura County. Consequently, the E-2 realignment action for NAWS Point Mugu conforms to the applicable SIP pursuant to 40 CFR 51.858(a)(5)(i)(A). Written concurrence with this evaluation has been requested from the Ventura County Air Pollution Control District.

NAWS Point Mugu will follow VCAPCD procedures to ensure that new, relocated, or modified facilities and equipment meet applicable VCAPCD rules and regulations (including all SIP requirements) prior to facility construction or installation.

D.7 Draft Record of Nonapplicability, Realignment of E-2 Squadrons from NAS Miramar to NAS Lemoore

NAS Lemoore straddles the boundary between Fresno and Kings Counties, California. Both Fresno County and Kings County are part of the San Joaquin Valley Air Basin. The San Joaquin Valley Air Basin is designated a severe ozone nonattainment area and a severe PM_{10} nonattainment area. The de minimis thresholds applicable to the San Joaquin Valley Air Basin are 50 tons per year for reactive organic compounds, 50 tons per year for nitrogen oxides, and 70 tons per year for PM_{10}.

Conformity-related emission estimates for the E-2 realignment action are summarized in Table D-69. The maximum annual conformity-related emissions will be 11.94 tons per year of reactive organic compounds, 34.19 tons per year of nitrogen oxides, and 16.41 tons per year of PM_{10}. These emission quantities would decline slightly after 1999 because construction activities would be complete and emissions from motor vehicles will continue to decline slightly each year. For

simplicity, this conformity analysis assumes that conformity-related emissions from the E-2 realignment action remain constant after the year 2000.

The conformity-related increases in nonattainment pollutants are all less than the relevant de minimis level for the San Joaquin Valley Air Basin. Consequently, the NAS Lemoore Alternative for the realignment of E-2 aircraft would be exempt from Clean Air Act conformity determination requirements pursuant to 40 CFR 51.853(c)(1).

D.8 DRAFT RECORD OF NONAPPLICABILITY, REALIGNMENT OF E-2 SQUADRONS FROM NAS MIRAMAR TO NAF EL CENTRO

NAF El Centro is located in the portion of Imperial County, California that is included within the Salton Sea Air Basin. The Salton Sea Air Basin is designated a transitional ozone nonattainment area and a moderate PM_{10} nonattainment area. The de minimis thresholds applicable to the Salton Sea Air Basin are 100 tons per year for reactive organic compounds, 100 tons per year for nitrogen oxides, and 100 tons per year for PM_{10}.

Conformity-related emission estimates for the E-2 realignment action are summarized in Table D-70. The maximum annual conformity-related emissions will be 12.08 tons per year of reactive organic compounds, 34.39 tons per year of nitrogen oxides, and 17.49 tons per year of PM_{10}. These emission quantities would decline slightly after 1999 because construction activities would be complete and emissions from motor vehicles will continue to decline slightly each year. For simplicity, this conformity analysis assumes that conformity-related emissions from the E-2 realignment action remain constant after the year 2000.

The conformity-related increases in nonattainment pollutants are all less than the relevant de minimis level for the Salton Sea Air Basin. Consequently, the NAF El Centro Alternative for the realignment of E-2 aircraft would be exempt from Clean Air Act conformity determination requirements pursuant to 40 CFR 51.853(c)(1).

D.9 REFERENCES

ATAC Corporation. 1997. *NAS Lemoore F/A-18E/F Introduction and E-2 Realignment Airfield and Airspace Operational Study.* Draft Report. Prepared for Naval Facilities Engineering Command, Alexandria, VA. Sunnyvale, CA.

Bay Area Air Quality Management District. 1996. *BAAQMD CEQA Guidelines: Assessing the Air Quality Impacts of Projects and Plans.* San Francisco, CA.

Benson, P. E. 1989. *CALINE4 - A Dispersion Model for Predicting Air Pollutant Concentrations Near Roadways.* 1984 Final Report with 1986 and 1989 Revisions. FHWA/CA/TL-84/15. California Department of Transportation. Sacramento, CA.

California Air Resources Board. 1992. *BURDEN7C: Methodology for Estimating Emissions from On-road Motor Vehicles.* Technical Support Division. Sacramento, CA.

California Air Resources Board. 1993. *Methodology for Estimating Emissions from On-road Motor Vehicles. Volume I: EMFAC7F; Volume II: WEIGHT(E7FWT); Volume III: BURDEN7F. Draft.* Technical Support Division. Sacramento, CA.

California Department of Transportation. 1981. *The 1976-1980 Statewide Travel Survey.* Division of Transportation Planning. Sacramento, CA.

California Department of Transportation. 1992. *1991 Statewide Travel Survey: Summary of Findings* Office of Traffic Improvement. Sacramento, CA.

Castro, Tim. 1997a. *10-08-97 Fax, Annual Emissions From NAS Lemoore "Huffers" and TSE.* Sent by Tim Castro, Air Program Manager, NAS Lemoore.

Castro, Tim. 1997b. *10-08-97 Fax, Title V Emissions Inventory, Sep 96-Aug 97; TITVREP.XLS Printout.* Sent by Tim Castro, Air Program Manager, NAS Lemoore.

Huber, Derek. 1998. *3-10-98 E-Mail, E-2 Operations Data.* Sent by Derek Huber, ATAC Corporation, to Kelly Knight, Southwest Division Naval Facilities Engineering Command.

Hunn, Bruce D. (ed.). 1996. *Fundamentals of Building Energy Dynamics.* The MIT Press. Cambridge, MA.

George, Steve. 1998. *3-2-98 Fax, Vehicle Mileage Data for NAWS Point Mugu.* Sent by Steve George, NAWS Point Mugu Environmental Division (Anteon Corporation) to Robert Sculley, Tetra Tech.

Institute of Transportation Engineers. 1991. *Trip Generation: an Informational Report.* 5th Edition. (Publication No. IR-016C.) Washington, DC.

Nokes, W. A. and P. E. Benson. 1985. *Development of Worst Case Meteorology Criteria.* (FHWA/CA/TL-85/14.) California Department of Transportation. Sacramento, CA.

San Joaquin Valley Unified Air Pollution Control District. 1995. *Draft Revised Post 1996 Rate of Progress Plan.* Fresno, CA.

Sculley, R. D. 1989. "Vehicle Emission Rate Analysis for Carbon Monoxide Hot Spot Modeling." *JAPCA* 39(10):1334-1343.

Smith, M. and T. Aldrich. 1977. *Development of Revised Light-Duty-Vehicle Emission-Average Speed Relationships.* (EPA-460/3-77-011.) U.S. Environmental Protection Agency, Office of Mobile Source Air Pollution Control. Ann Arbor, MI.

Thompson, S. 1997. *7-18-97 E-Mail memo re. Best Estimates for Time-In-Mode Values, F/A-18E/F Aircraft.* Sent by Lt. Steven Thompson, F/A-18E/F Fleet Introduction Team, NAS Lemoore.

U.S. Environmental Protection Agency. 1985a. *Compilation of Air Pollutant Emission Factors. Volume I: Stationary Point and Area Sources.* 4th Edition. With Supplement A (1986), Supplement B (1988), Supplement C (1990), and Supplement D (1991). (AP-42.) Office of Air Quality Planning and Standards. Research Triangle Park, NC.

U.S. Environmental Protection Agency. 1985b. *Compilation of Air Pollutant Emission Factors. Volume II: Mobile Sources.* 4th Edition. With Supplement A (1991). (AP-42.) Office of Mobile Sources. Ann Arbor, MI.

U.S. Environmental Protection Agency. 1991. *Nonroad Engine and Vehicle Emission Study - Report.* (21A-2001.) Office of Air Radiation. Washington, DC. [PB9212696 from National Technical Information Service, Springfield, VA].

U.S. Environmental Protection Agency. 1992. *Procedures for Emission Inventory Preparation. Volume IV: Mobile Sources.* EPA-450/4-81-126d (revised). Office of Mobile Sources. Ann Arbor, MI.

U.S. Environmental Protection Agency. 1993. *Compilation of Air Pollutant Emission Factors. Fourth Edition. Volume I: Stationary Point and Area Sources, Supplement F.* (AP-42.) Office of Air Quality Planning and Standards. Research Triangle Park, NC.

U.S. Environmental Protection Agency. 1995. *Compilation of Air Pollutant Emission Factors. Volume I: Stationary Point and Area Sources.* 5th Edition. (AP-42.) Office of Air Quality Planning and Standards. Research Triangle Park, NC.

U.S. Federal Highway Administration. 1985. *Transportation Planning Data for Urbanized Areas Based on the 1980 Census.* (DOT-1-85-20.) Office of Highway Planning. Washington, DC.

U.S. Navy. 1990. *Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines.* (AESO Report No. 6-90). Aircraft Environmental Support Office (AESO), Naval Aviation Depot - North Island. San Diego, CA.

U.S. Navy. 1994. *FEIS: Base Realignment of Naval Air Station Lemoore, California - Volumes I, II, and III.* Western Division, Naval Facilities Engineering Command. San Bruno, CA.

U.S. Navy. 1997a. *Baseline Emission Reduction Study.* NAWS Point Mugu Environmental Division.

U.S. Navy. 1997b. *Draft Environmental Impact Statement for Development of Facilities to Support Basing US Pacific Fleet F/A-18E/F Aircraft on the West Coast of the United States.* Volumes I and II. Engineering Field Activity West. San Bruno, CA.

U.S. Navy. 1997c. *Gaseous and Particulate Emission Indexes for the F414 Turbofan Engine - Draft - Revised.* (AESO Memo Report No. 9725A). Aircraft Environmental Support Office (AESO), Naval Aviation Depot - North Island. San Diego, CA.

U.S. Navy. 1997d. *Revised Emissions From All Sources for NAWS Point Mugu for 1990 and 1996.* NAWS Point Mugu Environmental Division.

Ventura County Air Pollution Control District. 1994a. *Ventura County 1994 Air Quality Management Plan.* Ventura, CA.

Ventura County Air Pollution Control District. 1994b. *Ventura County 1994 Air Quality Management Plan. Appendix C-94: Emission Forecasts Documentation.* Ventura, CA.

Ventura County Air Pollution Control District. 1994c. *Ventura County 1994 Air Quality Management Plan. Appendix L-94: 1990 Baseline Emission Inventory Documentation.* Ventura, CA.

WeatherDisc Associates. 1990. *Worldwide Airfield Summaries (TD-9647). World WeatherDisc Version 2.1.* WeatherDisc Associates, Inc., Seattle, WA.

Wild, Alan. 1993. *Soils and the Environment: An Introduction.* Cambridge University Press. Cambridge, Great Britain.

Wyle Research. 1994. *Aircraft Noise Study for Naval Air Station Lemoore, California.* (WR 94-17). Arlington, VA.

Wyle Laboratories. 1997. *Aircraft Noise Study for Naval Air Facility El Centro, California.* December 1997 Draft. Arlington, VA.

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Construction Emissions Analysis

TABLE D-1. ESTIMATED CONSTRUCTION SITE ACREAGES FOR E-2 REALINGMENT ALTERNATIVES

ALTERNATIVE	FACILITY	BUILDING SQ FT	DISTURBED SITE MULTIPLIER	GROSS SITE ACRES	PRIMARY CONSTRUCTION YEAR
NAWS PT MUGU	HANGAR	7,000	1.25	0.20	1998
	AVIONICS SHOP	10,000	2	0.46	1998
	VEHICLE PARKING	123,750	1.1	3.13	1998
	OPERATIONAL TRAINER	9,644	2	0.44	1998
	1998 SUBTOTAL	150,394		4.23	1998
NAS LEMOORE	HANGARS	91,811	1.25	2.63	1998
	AIRCRAFT WASHRACK	30,600	1.25	0.88	1998
	PARKING APRON	397,350	1.1	10.03	1998
	POWER CHECK PAD	11,997	1.25	0.34	1998
	ENGINE MAINTENANCE	10,000	2	0.46	1998
	TEST CELL	7,065	1.5	0.24	1998
	AVIONICS SHOP	4,500	2	0.21	1998
	AIRFRAME SHOP	23,491	1.5	0.81	1998
	INSTRUCTION BUILDING	30,346	1.5	1.04	1998
	OPERATIONAL TRAINER	9,644	2	0.44	1998
	AEWWINGPAC BUILDING	14,000	1.5	0.48	1998
	VEHICLE PARKING	165,000	1.1	4.17	1998
	1998 SUBTOTAL	795,804		21.75	1998
	BEQ	110,760	1.5	3.81	1999
	CHILD CENTER	11,035	2	0.51	1999
	YOUTH CENTER	4,000	2	0.18	1999
	1999 SUBTOTAL	125,795		4.50	1999

TABLE D-1. ESTIMATED CONSTRUCTION SITE ACREAGES FOR E-2 REALINGMENT ALTERNATIVES

ALTERNATIVE	FACILITY	BUILDING SQ FT	DISTURBED SITE MULTIPLIER	GROSS SITE ACRES	PRIMARY CONSTRUCTION YEAR
NAF EL CENTRO	HANGARS	91,811	1.25	2.63	1998
	PARKING APRON	397,350	1.1	10.03	1998
	SUPPLY WAREHOUSE	40,000	1.25	1.15	1998
	ENGINE MAINTENANCE	20,000	1.5	0.69	1998
	TEST CELL	7,065	1.5	0.24	1998
	GSE STORAGE	11,555	1.25	0.33	1998
	GSE MAINTENANCE	8,445	1.25	0.24	1998
	AVIONICS SHOP	16,302	1.5	0.56	1998
	AIRFRAME SHOP	14,380	1.5	0.50	1998
	AEWWINGPAC BUILDING	14,000	1.5	0.48	1998
	INSTRUCTION BUILDING	30,346	1.5	1.04	1998
	OPERATIONAL TRAINER	9,644	2	0.44	1998
	VEHICLE PARKING	123,750	1.1	3.13	1998
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	1998 SUBTOTAL	784,648		21.47	1998
	BEQ	110,760	1.5	3.81	1999
	CHILD CENTER	11,035	2	0.51	1999
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	1999 SUBTOTAL	121,795		4.32	1999

Notes: The disturbed site multiplier converts facility size into an approximate construction site size (in square feet), including allowances for landscaping and parking when appropriate.
BEQ facilities are assumed to be multiple story buildings.

TABLE D-2. CONSTRUCTION ASSUMPTIONS FOR 1998 PROJECTS, NAWS POINT MUGU ALTERNATIVE

FUGITIVE DUST DATA INPUT SECTION:		Site & Foundation Preparation	Facility Construction
PM10 portion of fugitive TSP	=>	30%	30%
area subject to surface disturbance	=>	4.2 acres	0.8 acres
typical area disturbed on any one day	=>	4.2 acres	0.8 acres
duration of activity phase on any area	=>	30 days	90 days
dust control program effectiveness	=>	50%	50%
Nominal Construction Period by Phase:		30 days	90 days
Nominal Overall Construction Period:		120 days	
Fugitive Dust PM10 Rate, lbs/acre-day:		12.0 lbs/ac-d	12.0 lbs/ac-d

CONSTRUCTION VEHICLE DATA INPUT SECTION:		Site & Foundation Preparation		Facility Construction	
		Number of Vehicles	Hours per Day	Number of Vehicles	Hours per Day
track-type tractor	=>				
wheeled tractor	=>	1	4	1	2
cold planers and wheeled dozers	=>	1	4		
scraper	=>				
motor grader	=>	1	4		
wheeled loader	=>	2	6	1	2
track-type loader	=>				
off-highway truck	=>	2	8	1	4
static and vibratory rollers	=>	1	2	1	2
excavators/crawlers, trenchers	=>	1	4		
concrete pavers, asphalt pavers	=>	1	6	1	2
cranes and miscellaneous equipment	=>			1	4
Total Number of Construction Vehicles:			10		6
Construction Equipment Fuel Use Estimate, gallons/day:			434		107
Mean Fuel Consumption Rate, gallons/vehicle-hour:			8.3		6.7
Cumulative Hours of Heavy Equipment Use:			1,560		1,440
Total Cumulative Hours of Heavy Equipment Use:				3,000	

Notes: The PM10 fraction of fugitive dust is based on typical silt plus clay content of project area soil types (mostly clay loams).
Areas subject to surface disturbance include the entire construction site during site and foundation preparation; facility footprints and areas paved early in the construction process are excluded from the disturbed area during actual facility construction.
Construction equipment numbers are estimated from construction site sizes and the nature of individual construction projects.
Dust control program effectiveness assumes implementation of normal fugitive dust control practices.

TABLE D-3. 1998 CONSTRUCTION SEASON EMISSIONS, NAWS POINT MUGU ALTERNATIVE

Construction Phase	Construction Period Emissions (tons)				
	ROG	NOx	CO	SOx	PM10
Site Preparation Emissions	0.1	2.0	1.0	0.2	0.9
Facility Construction Emissions	0.1	1.6	0.9	0.2	0.5
Total Construction Period Emissions	0.3	3.6	1.9	0.3	1.4

Nonimal Site and Foundation Preparation Period:	30 days
Nominal Facility Construction Period:	90 days
Nominal Acre-Days for Site and Foundation Preparation:	126 acre-days
Nominal Acre-Days for Facility Construction:	72 acre-days
Equipment Use for Site and Foundation Preparation:	1,560 vehicle-hours
Equipment Use for Facility Construction:	1,440 vehicle-hours
Normalized Equipment Use, Site & Foundation Preparation:	12.38 hours/acre-day
Normalized Equipment Use, Facility Construction:	20.00 hours/acre-day

Notes: ROG = reactive organic compounds
NOx = oxides of nitrogen
CO = carbon monoxide
PM10 = inhalable particulate matter
SOx = sulfur oxides

The PM10 fraction of fugitive dust is based on typical silt plus clay content of project area soil types (mostly clay loams).
Areas subject to surface disturbance include the entire construction site during site and foundation preparation; facility footprints and areas paved early in the construction process are excluded from the disturbed area during actual facility construction.
Construction equipment numbers are estimated from construction site sizes and the nature of individual construction projects.
Dust control program effectiveness assumes implementation of normal fugitive dust control practices.

Data Sources: Emission rate data and procedures from U.S. Environmental Protection Agency 1985 (AP-42, Volume II, Section II-7) and U.S. Environmental Protection Agency 1995 (AP-42, Volume I, Section 13.2.3).
Diesel vehicle exhaust TOG emission rates converted to ROG emission rates using 97.58% factor obtained from California Air Resources Board.

TABLE D-4. CONSTRUCTION ASSUMPTIONS FOR 1998 PROJECTS, NAS LEMOORE ALTERNATIVE

FUGITIVE DUST DATA INPUT SECTION:		Site & Foundation Preparation		Facility Construction	
PM10 portion of fugitive TSP	=>	30%		30%	
area subject to surface disturbance	=>	22	acres	3.5	acres
typical area disturbed on any one day	=>	11	acres	3.5	acres
duration of activity phase on any area	=>	45	days	120	days
dust control program effectiveness	=>	55%		55%	
Nominal Construction Period by Phase:		90	days	120	days
Nominal Overall Construction Period:		210 days			
Fugitive Dust PM10 Rate, lbs/acre-day:		10.8	lbs/ac-d	10.8	lbs/ac-d

CONSTRUCTION VEHICLE DATA INPUT SECTION:		Site & Foundation Preparation		Facility Construction	
		Number of Vehicles	Hours per Day	Number of Vehicles	Hours per Day
track-type tractor	=>				
wheeled tractor	=>	1	4	1	2
cold planers and wheeled dozers	=>	1	4		
scraper	=>	2	4		
motor grader	=>	2	4		
wheeled loader	=>	2	6	1	2
track-type loader	=>				
off-highway truck	=>	4	8	3	6
static and vibratory rollers	=>	1	2	1	2
excavators/crawlers, trenchers	=>	2	4		
concrete pavers, asphalt pavers	=>	2	6	1	2
cranes and miscellaneous equipment	=>			2	4
Total Number of Construction Vehicles:			17		9
Construction Equipment Fuel Use Estimate, gallons/day:			842		329
Mean Fuel Consumption Rate, gallons/vehicle-hour:			9.4		9.7
Cumulative Hours of Heavy Equipment Use:			8,100		4,080
Total Cumulative Hours of Heavy Equipment Use:				12,180	

Notes: The PM10 fraction of fugitive dust is based on typical silt plus clay content of project area soil types (mostly clay loams).
Areas subject to surface disturbance include the entire construction site during site and foundation preparation; facility footprints and areas paved early in the construction process are excluded from the disturbed area during actual facility construction.
Construction equipment numbers are estimated from construction site sizes and the nature of individual construction projects.
Dust control program effectiveness assumes implementation of comprehensive fugitive dust control practices.

TABLE D-5. 1998 CONSTRUCTION SEASON EMISSIONS, NAS LEMOORE ALTERNATIVE

Construction Phase	Construction Period Emissions (tons) ROG	NOx	CO	SOx	PM10
Site Preparation Emissions	0.7	11.2	5.0	1.2	6.2
Facility Construction Emissions	0.4	6.0	2.9	0.6	2.7
Total Construction Period Emissions	1.1	17.2	7.9	1.8	8.8

Nonimal Site and Foundation Preparation Period:	90 days
Nominal Facility Construction Period:	120 days
Nominal Acre-Days for Site and Foundation Preparation:	990 acre-days
Nominal Acre-Days for Facility Construction:	420 acre-days
Equipment Use for Site and Foundation Preparation:	8,100 vehicle-hours
Equipment Use for Facility Construction:	4,080 vehicle-hours
Normalized Equipment Use, Site & Foundation Preparation:	8.18 hours/acre-day
Normalized Equipment Use, Facility Construction:	9.71 hours/acre-day

Notes: ROG = reactive organic compounds
NOx = oxides of nitrogen
CO = carbon monoxide
PM10 = inhalable particulate matter
SOx = sulfur oxides

The PM10 fraction of fugitive dust is based on typical silt plus clay content of project area soil types (mostly clay loams).
Areas subject to surface disturbance include the entire construction site during site and foundation preparation; facility footprints and areas paved early in the construction process are excluded from the disturbed area during actual facility construction.
Construction equipment numbers are estimated from construction site sizes and the nature of individual construction projects.
Dust control program effectiveness assumes implementation of comprehensive fugitive dust control practices.

Data Sources: Emission rate data and procedures from U.S. Environmental Protection Agency 1985 (AP-42, Volume II, Section II-7) and U.S. Environmental Protection Agency 1995 (AP-42, Volume I, Section 13.2.3).
Diesel vehicle exhaust TOG emission rates converted to ROG emission rates using 97.58% factor obtained from California Air Resources Board.

TABLE D-6. CONSTRUCTION ASSUMPTIONS FOR 1999 PROJECTS, NAS LEMOORE ALTERNATIVE

FUGITIVE DUST DATA INPUT SECTION:		Site & Foundation Preparation	Facility Construction
PM10 portion of fugitive TSP	=>	30%	30%
area subject to surface disturbance	=>	4.5 acres	1.6 acres
typical area disturbed on any one day	=>	4.5 acres	1.6 acres
duration of activity phase on any area	=>	20 days	75 days
dust control program effectiveness	=>	55%	55%
Nominal Construction Period by Phase:		20 days	75 days
Nominal Overall Construction Period:		95 days	
Fugitive Dust PM10 Rate, lbs/acre-day:		10.8 lbs/ac-d	10.8 lbs/ac-d

CONSTRUCTION VEHICLE DATA INPUT SECTION:		Site & Foundation Preparation		Facility Construction	
		Number of Vehicles	Hours per Day	Number of Vehicles	Hours per Day
track-type tractor	=>				
wheeled tractor	=>			1	2
cold planers and wheeled dozers	=>	1	4		
scraper	=>				
motor grader	=>	1	4		
wheeled loader	=>	2	4		
track-type loader	=>				
off-highway truck	=>	2	6	2	4
static and vibratory rollers	=>			1	2
excavators/crawlers, trenchers	=>	1	4		
concrete pavers, asphalt pavers	=>			1	2
cranes and miscellaneous equipment	=>			1	4
Total Number of Construction Vehicles:			7		6
Construction Equipment Fuel Use Estimate, gallons/day:			309		154
Mean Fuel Consumption Rate, gallons/vehicle-hour:			9.7		8.5
Cumulative Hours of Heavy Equipment Use:			640		1,350
Total Cumulative Hours of Heavy Equipment Use:				1,990	

Notes: The PM10 fraction of fugitive dust is based on typical silt plus clay content of project area soil types (mostly clay loams).
Areas subject to surface disturbance include the entire construction site during site and foundation preparation; facility footprints and areas paved early in the construction process are excluded from the disturbed area during actual facility construction.
Construction equipment numbers are estimated from construction site sizes and the nature of individual construction projects.
Dust control program effectiveness assumes implementation of comprehensive fugitive dust control practices.

TABLE D-7. 1999 CONSTRUCTION SEASON EMISSIONS, NAS LEMOORE ALTERNATIVE

Construction Phase	Construction Period Emissions (tons)				
	ROG	NOx	CO	SOx	PM10
Site Preparation Emissions	0.1	0.9	0.4	0.1	0.5
Facility Construction Emissions	0.1	1.8	1.0	0.2	0.8
Total Construction Period Emissions	0.2	2.7	1.4	0.3	1.3

Nonimal Site and Foundation Preparation Period:	20 days
Nominal Facility Construction Period:	75 days
Nominal Acre-Days for Site and Foundation Preparation:	90 acre-days
Nominal Acre-Days for Facility Construction:	120 acre-days
Equipment Use for Site and Foundation Preparation:	640 vehicle-hours
Equipment Use for Facility Construction:	1,350 vehicle-hours
Normalized Equipment Use, Site & Foundation Preparation:	7.11 hours/acre-day
Normalized Equipment Use, Facility Construction:	11.25 hours/acre-day

Notes: ROG = reactive organic compounds
NOx = oxides of nitrogen
CO = carbon monoxide
PM10 = inhalable particulate matter
SOx = sulfur oxides

The PM10 fraction of fugitive dust is based on typical silt plus clay content of project area soil types (mostly clay loams).
Areas subject to surface disturbance include the entire construction site during site and foundation preparation; facility footprints and areas paved early in the construction process are excluded from the disturbed area during actual facility construction.
Construction equipment numbers are estimated from construction site sizes and the nature of individual construction projects.
Dust control program effectiveness assumes implementation of comprehensive fugitive dust control practices.

Data Sources: Emission rate data and procedures from U.S. Environmental Protection Agency 1985 (AP-42, Volume II, Section II-7) and U.S. Environmental Protection Agency 1995 (AP-42, Volume I, Section 13.2.3).
Diesel vehicle exhaust TOG emission rates converted to ROG emission rates using 97.58% factor obtained from California Air Resources Board.

TABLE D-8. CONSTRUCTION ASSUMPTIONS FOR 1998 PROJECTS, NAF EL CENTRO ALTERNATIVE

FUGITIVE DUST DATA INPUT SECTION:		Site & Foundation Preparation	Facility Construction
PM10 portion of fugitive TSP	=>	20%	20%
area subject to surface disturbance	=>	21.5 acres	3.5 acres
typical area disturbed on any one day	=>	11 acres	3.5 acres
duration of activity phase on any area	=>	50 days	120 days
dust control program effectiveness	=>	50%	50%
Nominal Construction Period by Phase:		98 days	120 days
Nominal Overall Construction Period:		218 days	
Fugitive Dust PM10 Rate, lbs/acre-day:		8.0 lbs/ac-d	8.0 lbs/ac-d

CONSTRUCTION VEHICLE DATA INPUT SECTION:		Site & Foundation Preparation		Facility Construction	
		Number of Vehicles	Hours per Day	Number of Vehicles	Hours per Day
track-type tractor	=>				
wheeled tractor	=>	1	4	1	2
cold planers and wheeled dozers	=>	1	4		
scraper	=>	2	4		
motor grader	=>	2	4		
wheeled loader	=>	2	6	1	2
track-type loader	=>				
off-highway truck	=>	4	8	3	6
static and vibratory rollers	=>	1	2	1	2
excavators/crawlers, trenchers	=>	2	4		
concrete pavers, asphalt pavers	=>	2	6	1	2
cranes and miscellaneous equipment	=>			2	4
Total Number of Construction Vehicles:			17		9
Construction Equipment Fuel Use Estimate, gallons/day:			842		329
Mean Fuel Consumption Rate, gallons/vehicle-hour:			9.4		9.7
Cumulative Hours of Heavy Equipment Use:			8,795		4,080
Total Cumulative Hours of Heavy Equipment Use:				12,875	

Notes: The PM10 fraction of fugitive dust is based on typical silt plus clay content of project area soil types (mostly sandy loam or sandy clay loam).
Areas subject to surface disturbance include the entire construction site during site and foundation preparation; facility footprints and areas paved early in the construction process are excluded from the disturbed area during actual facility construction.
Construction equipment numbers are estimated from construction site sizes and the nature of individual construction projects.
Dust control program effectiveness assumes implementation of normal fugitive dust control practices.

TABLE D-9. 1998 CONSTRUCTION SEASON EMISSIONS, NAF EL CENTRO ALTERNATIVE

Construction Phase	Construction Period Emissions (tons)				
	ROG	NOx	CO	SOx	PM10
Site Preparation Emissions	0.8	12.2	5.4	1.3	5.2
Facility Construction Emissions	0.4	6.0	2.9	0.6	2.1
Total Construction Period Emissions	1.1	18.2	8.3	1.9	7.3

Nonimal Site and Foundation Preparation Period:	98 days
Nominal Facility Construction Period:	120 days
Nominal Acre-Days for Site and Foundation Preparation:	1,075 acre-days
Nominal Acre-Days for Facility Construction:	420 acre-days
Equipment Use for Site and Foundation Preparation:	8,795 vehicle-hours
Equipment Use for Facility Construction:	4,080 vehicle-hours
Normalized Equipment Use, Site & Foundation Preparation:	8.18 hours/acre-day
Normalized Equipment Use, Facility Construction:	9.71 hours/acre-day

Notes: ROG = reactive organic compounds
NOx = oxides of nitrogen
CO = carbon monoxide
PM10 = inhalable particulate matter
SOx = sulfur oxides

The PM10 fraction of fugitive dust is based on typical silt plus clay content of project area soil types (mostly sandy loam or sandy clay loam)
Areas subject to surface disturbance include the entire construction site during site and foundation preparation; facility footprints and areas paved early in the construction process are excluded from the disturbed area during actual facility construction.
Construction equipment numbers are estimated from construction site sizes and the nature of individual construction projects.
Dust control program effectiveness assumes implementation of normal fugitive dust control practices.

Data Sources: Emission rate data and procedures from U.S. Environmental Protection Agency 1985 (AP-42, Volume II, Section II-7) and U.S. Environmental Protection Agency 1995 (AP-42, Volume I, Section 13.2.3).
Diesel vehicle exhaust TOG emission rates converted to ROG emission rates using 97.58% factor obtained from California Air Resources Board.

TABLE D-10. CONSTRUCTION ASSUMPTIONS FOR 1999 PROJECTS, NAF EL CENTRO ALTERNATIVE

FUGITIVE DUST DATA INPUT SECTION:		Site & Foundation Preparation	Facility Construction
PM10 portion of fugitive TSP	=>	20%	20%
area subject to surface disturbance	=>	4.3 acres	1.5 acres
typical area disturbed on any one day	=>	4.3 acres	1.5 acres
duration of activity phase on any area	=>	20 days	75 days
dust control program effectiveness	=>	50%	50%
Nominal Construction Period by Phase:		20 days	75 days
Nominal Overall Construction Period:		95 days	
Fugitive Dust PM10 Rate, lbs/acre-day:		8.0 lbs/ac-d	8.0 lbs/ac-d

CONSTRUCTION VEHICLE DATA INPUT SECTION:		Site & Foundation Preparation		Facility Construction	
		Number of Vehicles	Hours per Day	Number of Vehicles	Hours per Day
track-type tractor	=>				
wheeled tractor	=>			1	2
cold planers and wheeled dozers	=>	1	4		
scraper	=>				
motor grader	=>	1	4		
wheeled loader	=>	2	4		
track-type loader	=>				
off-highway truck	=>	2	6	2	4
static and vibratory rollers	=>			1	2
excavators/crawlers, trenchers	=>	1	4		
concrete pavers, asphalt pavers	=>			1	2
cranes and miscellaneous equipment	=>			1	4
Total Number of Construction Vehicles:		7			6
Construction Equipment Fuel Use Estimate, gallons/day:		309			154
Mean Fuel Consumption Rate, gallons/vehicle-hour:		9.7			8.5
Cumulative Hours of Heavy Equipment Use:		640			1,350
Total Cumulative Hours of Heavy Equipment Use:				1,990	

Notes: The PM10 fraction of fugitive dust is based on typical silt plus clay content of project area soil types (mostly sandy loam or sandy clay loam).
Areas subject to surface disturbance include the entire construction site during site and foundation preparation; facility footprints and areas paved early in the construction process are excluded from the disturbed area during actual facility construction.
Construction equipment numbers are estimated from construction site sizes and the nature of individual construction projects.
Dust control program effectiveness assumes implementation of normal fugitive dust control practices.

TABLE D-11. 1999 CONSTRUCTION SEASON EMISSIONS, NAF EL CENTRO ALTERNATIVE

	Construction Period Emissions (tons)				
Construction Phase	ROG	NOx	CO	SOx	PM10
Site Preparation Emissions	0.1	0.9	0.4	0.1	0.4
Facility Construction Emissions	0.1	1.8	1.0	0.2	0.6
Total Construction Period Emissions	0.2	2.7	1.4	0.3	1.0

Nonimal Site and Foundation Preparation Period:	20 days
Nominal Facility Construction Period:	75 days
Nominal Acre-Days for Site and Foundation Preparation:	86 acre-days
Nominal Acre-Days for Facility Construction:	113 acre-days
Equipment Use for Site and Foundation Preparation:	640 vehicle-hours
Equipment Use for Facility Construction:	1,350 vehicle-hours
Normalized Equipment Use, Site & Foundation Preparation:	7.44 hours/acre-day
Normalized Equipment Use, Facility Construction:	12.00 hours/acre-day

Notes: ROG = reactive organic compounds
NOx = oxides of nitrogen
CO = carbon monoxide
PM10 = inhalable particulate matter
SOx = sulfur oxides

The PM10 fraction of fugitive dust is based on typical silt plus clay content of project area soil types (mostly sandy loam or sandy clay loam)
Areas subject to surface disturbance include the entire construction site during site and foundation preparation; facility footprints and areas paved early in the construction process are excluded from the disturbed area during actual facility construction.
Construction equipment numbers are estimated from construction site sizes and the nature of individual construction projects.
Dust control program effectiveness assumes implementation of normal fugitive dust control practices.

Data Sources: Emission rate data and procedures from U.S. Environmental Protection Agency 1985 (AP-42, Volume II, Section II-7) and U.S. Environmental Protection Agency 1995 (AP-42, Volume I, Section 13.2.3).
Diesel vehicle exhaust TOG emission rates converted to ROG emission rates using 97.58% factor obtained from California Air Resources Board.

TABLE D-12. CONSTRUCTION ACTIVITY EMISSION FACTORS

EQUIPMENT TYPE	EMISSION RATE, GRAMS/HOUR ROG	NOx	CO	PM10	SOx	FUEL USE (gal/hr)
track-type tractor	53.73	570.70	157.01	50.70	62.30	4.4
wheeled tractor	83.20	575.84	1,622.77	61.50	40.90	2.9
cold planers and wheeled dozers	84.74	1,889.16	816.81	75.00	158.00	14.6
scraper	125.05	1,740.74	568.19	184.00	210.00	14.8
motor grader	17.63	324.43	68.46	27.70	39.00	2.8
wheeled loader	110.43	858.19	259.58	77.90	82.50	5.8
track-type loader	43.47	375.22	91.15	26.40	34.40	2.4
off-highway truck	84.74	1,889.16	816.81	116.00	206.00	14.6
static and vibratory rollers	29.84	392.90	137.97	22.70	30.50	2.1
excavators/crawlers, trenchers	67.67	767.30	306.37	63.20	64.70	4.5
concrete pavers, asphalt pavers	67.67	767.30	306.37	63.20	64.70	4.5
cranes and miscellaneous equipment	67.67	767.30	306.37	63.20	64.70	4.5

FUGITIVE DUST TSP EMISSION RATE: 1.2 TONS/ACRE/MONTH, 30 WORK DAYS/MONTH

SOIL TEXTURE CLASS	PERCENT CLAY + SILT	ESTIMATED % PM10
Clay	45 - 100 %	30 - 85 %
Silt	80 - 100 %	40 - 80 %
Silty Clay	80 - 100 %	40 - 70 %
Silty Loam	50 - 100 %	30 - 70 %
Silty Clay Loam	80 - 100 %	30 - 60 %
Clay Loam	45 - 80 %	30 - 50 %
Loam	45 - 75 %	25 - 45 %
Sandy Clay	35 - 55 %	25 - 45 %
Sandy Clay Loam	20 - 55 %	15 - 40 %
Sandy Loam	15 - 55 %	10 - 30 %
Sand	0 - 15 %	0 - 10 %

Notes:
ROG = reactive organic compounds
NOx = oxides of nitrogen
CO = carbon monoxide
PM10 = inhalable particulate matter (below 50 microns aerodynamic equivalent diameter)
SOx = sulfur oxides
TSP = total suspended particulate matter
Clay = soil particles with a sieve diameter below 2 microns (may form large particle aggregates)
Silt = soil particles with a sieve diameter between 2 and 50 microns
Diesel exhaust ROG = 97.58% of TOG (California Air Resources Board EMFAC7F model)

Data Sources:
U.S. Environmental Protection Agency, 1985b: (AP-42, Volume II, Section II-7)
U.S. Environmental Protection Agency, 1995: (AP-42, Volume I, Section 13.2.3).
Wild, Alan. 1993. Soils and the Environment: An Introduction. Cambridge University Press.

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E-2 Aircraft Emissions Analysis

TABLE D-13. ANNUAL E-2 FLIGHT ACTIVITY ESTIMATES

ANALYSIS FORMAT	EVENT CATEGORY	NUMBER OF FLIGHT OPERATIONS DAY	EVENING	NIGHT	TOTAL	TOTAL EVENTS
NASMOD BASIC OPERATIONS	Departures	621	144	244	1,009	1,009
	Full Stop Visual Landing	527	57	217	801	801
	Full Stop Instrument Landing	56	10	141	207	207
	FCLP Operations	5,550	810	3,560	9,920	4,960
	ACLS Operations	112	1,986	4,710	6,808	3,404
	Visual Touch & Go or Low Approach	1,660	38	4	1,702	851
	Instrument Touch & Go or Low Approach	318	2	0	320	160
	TOTAL	8,844	3,047	8,876	20,767	11,392
AIR QUALITY	Takeoffs with Preflight Checks	nr	nr	nr	556	556
	Full Stop Landings	nr	nr	nr	556	556
	FCLP Landing for Pilot Switch	nr	nr	nr	302	302
	FLCP Takeoff after Pilot Switch	nr	nr	nr	302	302
	FCLP Landing for 2-Pilot Switch	nr	nr	nr	151	151
	FLCP Takeoff after 2-Pilot Switch	nr	nr	nr	151	151
	FCLP Patterns	nr	nr	nr	9,920	4,960
	ACLS Patterns	nr	nr	nr	6,808	3,404
	Touch & Go Patterns	nr	nr	nr	1,702	851
	GCA Box Patterns	nr	nr	nr	320	160
	TOTAL				20,768	11,393

Notes: nr = not required for air quality analyses
NASMOD = Naval Aviation Simulation Model
FCLP = Field Carrier Landing Practice
ACLS = Automated Carrier Landing System (similar to FCLP pattern)
GCA = Ground Controlled Approach
Flight operations are individual approach/landing or takeoff/climbout actions.
Pattern events include two operations (approach and climbout).
Data from the NASMOD study (ATAC Corportation 1997) have been regrouped for the air quality analyses based on information provided by Huber (1998).
FCLP pattern operations for E-2 aircraft have two pilots aboard. E-2 aircraft periodically taxi to the airfield ramp area between groups of pattern loops to let the pilots switch positions while the engines continue to idle. After the first pair of pilots have completed their FCLP operations, the aircraft taxis to the ramp area where a second pair of pilots replace the first pair. The FCLP pattern operations continue with the second pair of pilots.

Data Source:
ATAC Corporation. 1997. NAS Lemoore F/A-18E/F Introduction and E-2 Realignment Airfield and Airspace Operational Study. Draft Report.
Huber, Derek. 1998. 3-10-98 E-Mail, E-2 Operations Data. Sent by Derek Huber, ATAC Corporation, to Kelly Knight, Southwest Division Naval Facilities Engineering Command.

TABLE D-14. DATA USED TO ESTIMATE EMISSIONS FROM ADDED E-2 FLIGHT OPERATIONS

Aircraft Type	Number of Engines	Engine Models Used For Emissions Analysis	Annual Flight Operations	Flight Activity	Fraction of Annual Flight Operations	Flight Mode	Engine Power or Thrust Setting	Total Annual Flight Operations	Average Daily Flight Operations: Spring - Fall	Average Daily Flight Operations: Winter	Time In Mode (minutes)	Fuel Flow Rate per Engine (lb/hr)	Modal Emission Rate (pounds per 1,000 pounds fuel flow): Total Organics	Nitrogen Oxides	Carbon Monoxide	Sulfur Oxides	Particulate Matter
E-2	2	T56-A-16, T56-A-7	20,768	Takeoff	2.68%	Taxi out	G Idle 1	556	1.6	1.2	19.0	599	22.32	3.53	30.11	0.40	2.92
						Takeoff	Military	556	1.6	1.2	0.5	2,219	0.16	10.45	0.65	0.40	1.78
						Climbout	100%	556	1.6	1.2	2.5	2,136	0.14	10.29	0.68	0.40	1.57
				Landing	2.68%	Approach	75%	556	1.6	1.2	5.6	1,996	0.19	9.93	0.42	0.40	2.85
						Taxi in	G Idle 1	556	1.6	1.2	7.0	599	22.32	3.53	30.11	0.40	2.92
				Touch-and-Go	8.20%	Approach	75%	851	2.5	1.9	4.5	1,996	0.19	9.93	0.42	0.40	2.85
						Climbout	100%	851	2.5	1.9	2.3	2,136	0.14	10.29	0.68	0.40	1.57
						Circle	75%	851	2.5	1.9	2.3	1,996	0.19	9.93	0.42	0.40	2.85
				FCLP	47.77%	Approach	75%	4,960	14.5	10.9	1.0	1,996	0.19	9.93	0.42	0.40	2.85
						Climbout	100%	4,960	14.5	10.9	1.6	2,136	0.14	10.29	0.68	0.40	1.57
						Circle	75%	4,960	14.5	10.9	1.4	1,996	0.19	9.93	0.42	0.40	2.85
				FCLP Pilot	2.91%	Taxi/Idle	G Idle 1	302	0.9	0.7	8.0	599	22.32	3.53	30.11	0.40	2.92
				Switch	1.45%	Taxi/Idle	G Idle 1	151	0.4	0.3	12.0	599	22.32	3.53	30.11	0.40	2.92
						Takeoff	Military	453	1.3	1.0	0.5	2,219	0.16	10.45	0.65	0.40	1.78
				ACLS	32.78%	Approach	75%	3,404	9.9	7.5	2.0	1,996	0.19	9.93	0.42	0.40	2.85
						Climbout	100%	3,404	9.9	7.5	3.2	2,136	0.14	10.29	0.68	0.40	1.57
						Circle	75%	3,404	9.9	7.5	2.8	1,996	0.19	9.93	0.42	0.40	2.85
				GCA Box	1.54%	Approach	75%	160	0.5	0.4	4.9	1,996	0.19	9.93	0.42	0.40	2.85
						Climbout	100%	160	0.5	0.4	3.7	2,136	0.14	10.29	0.68	0.40	1.57
						Circle	75%	160	0.5	0.4	7.1	1,996	0.19	9.93	0.42	0.40	2.85
E-2 Subtotal below 3,000 feet					100.00%			20,768	60.6	45.8							

TABLE D-14. DATA USED TO ESTIMATE EMISSIONS FROM ADDED E-2 FLIGHT OPERATIONS

Notes:

FLCP = field carrier landing practice

ACLS = automated carrier landing system

GCA = ground controlled approach

G Idle 1 = low speed ground idle

Emission factors used for this analysis come from engine models which most closely match the actual engines used in E-2 aircraft.

Estimates of added flight operations for E-2 aircraft are based on data from the 1997 NASMOD (Naval Aviation Simulation Model) study (ATAC Corporation 1997), recategorized as indicated by Huber (1998) (see Table D-13).

Takeoffs and landings each represent a single flight operation; touch-and-go, FCLP, ACLS, and GCA box patterns each represent two flight operations (approach and climbout).

Flight operation totals are the sum of approach mode and takeoff/climbout mode numbers.

Time-in-mode estimates for E-2 takeoffs and landings based on EPA default values, which include allowance for idling during preflight checks.

Approach time-in-mode for landings is a weighted mean of straight-in approaches and overhead break approaches.

Time-in-mode estimates for Touch-and-Go, FCLP, and GCA pattern events based on flight track profile data from Wyle Research (1994).

Approach time-in-mode for touch-and-go patterns assumes an overhead break approach pattern.

Taxi/idling delay times during FCLP interruptions to allow pilot switching are based on data in Huber (1998).

Time-in-mode estimated for ACLS pattern events set as twice the time-in-mode values for FCLP pattern events.

Circle time for repeated pattern operations (touch-and-go, FLCP, ACLS, GCA) normally occurs at altitudes below 3,000 feet.

Engine power setting assumptions based on data from Navy Aircraft Environmental Support Office (AESO) personnel, NAS Lemoore personnel, EPA 1985, and EPA 1992.

Approach and circle mode power settings shown for E-2 aircraft are settings for available emission rates; actual flight mode settings are 40% for approach and 50% for circle modes.

Aircraft engine emission rates based on data from AESO Report 6-90, EPA 1985, and EPA 1992.

Taxi/idle times assume low speed ground idle.

Particulate matter emission rates for E-2 aircraft are based on T56-A-7 engine data from EPA 1992.

Sulfur oxide emissions assume a fixed emission rate of 0.4 pounds per 1,000 pounds of fuel (0.02% fuel sulfur content).

Typical day operations assume 80% of annual operations during spring through fall (274 days) and 20% of annual operations during winter (91 days).

All values independently rounded for display after calculation.

Data Sources:

ATAC Corporation. 1997. NAS Lemoore F/A-18E/F Introduction and E-2 Realignment Airfield and Airspace Operational Study. Draft Report.

Huber, Derek. 1998. 3-10-98 E-Mail, E-2 Operations Data. Sent by Derek Huber, ATAC Corporation, to Kelly Knight, Southwest Division Naval Facilities Engineering Command.

U.S. Navy, 1990. Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines (AESO Report No. 6-90).

U.S. Environmental Protection Agency, 1992. Procedures for Emission Inventory Preparation. Volume IV: Mobile Sources (EPA-450/4-81-026d(revised)).

Wyle Research, 1994. Aircraft Noise Study for Naval Air Station Lemoore, California (WR 94-17).

TABLE D-15. ESTIMATED EMISSIONS FROM ADDED E-2 FLIGHT OPERATIONS

Aircraft Type	Flight Activity	Flight Mode	Average Daily Summer Emissions (pounds/day) Reactive Organics	Nitrogen Oxides	Carbon Monoxide	Sulfur Oxides	Particulate Matter	Average Daily Winter Emissions (pounds/day) Reactive Organics	Nitrogen Oxides	Carbon Monoxide	Sulfur Oxides	Particulate Matter	Total Emissions from Annual Flight Operations (tons/year) Reactive Organics	Nitrogen Oxides	Carbon Monoxide	Sulfur Oxides	Particulate Matter
E-2	Takeoff	Taxi out	13.5	2.1	18.3	0.2	1.8	10.2	1.6	13.7	0.2	1.3	2.35	0.37	3.18	0.04	0.31
		Takeoff	0.0	0.6	0.0	0.0	0.1	0.0	0.5	0.0	0.0	0.1	0.00	0.11	0.01	0.00	0.02
		Climbout	0.0	2.9	0.2	0.1	0.4	0.0	2.2	0.1	0.1	0.3	0.01	0.51	0.03	0.02	0.08
	Landing	Approach	0.1	5.9	0.3	0.2	1.7	0.1	4.4	0.2	0.2	1.3	0.02	1.03	0.04	0.04	0.30
		Taxi in	5.0	0.8	6.7	0.1	0.7	3.7	0.6	5.1	0.1	0.5	0.87	0.14	1.17	0.02	0.11
	Touch-and-Go	Approach	0.1	7.4	0.3	0.3	2.1	0.1	5.6	0.2	0.2	1.6	0.02	1.27	0.05	0.05	0.36
		Climbout	0.1	4.2	0.3	0.2	0.6	0.0	3.2	0.2	0.1	0.5	0.01	0.72	0.05	0.03	0.11
		Circle	0.1	3.8	0.2	0.2	1.1	0.1	2.9	0.1	0.1	0.8	0.01	0.65	0.03	0.03	0.19
	FCLP	Approach	0.2	9.6	0.4	0.4	2.7	0.1	7.2	0.3	0.3	2.1	0.03	1.64	0.07	0.07	0.47
		Climbout	0.2	17.0	1.1	0.7	2.6	0.2	12.8	0.8	0.5	1.9	0.04	2.91	0.19	0.11	0.44
		Circle	0.3	13.4	0.6	0.5	3.8	0.2	10.1	0.4	0.4	2.9	0.04	2.29	0.10	0.09	0.66
	FCLP Pilot Switch	Taxi/Idle	3.2	0.5	4.3	0.1	0.4	2.5	0.4	3.4	0.0	0.3	0.54	0.09	0.73	0.01	0.07
		Taxi/Idle	2.1	0.3	2.9	0.0	0.3	1.6	0.3	2.2	0.0	0.2	0.40	0.06	0.54	0.01	0.05
		Takeoff	0.0	0.5	0.0	0.0	0.1	0.0	0.4	0.0	0.0	0.1	0.00	0.09	0.01	0.00	0.01
	ACLS	Approach	0.3	13.1	0.6	0.5	3.8	0.2	9.9	0.4	0.4	2.8	0.04	2.25	0.10	0.09	0.65
		Climbout	0.3	23.2	1.5	0.9	3.5	0.2	17.6	1.2	0.7	2.7	0.05	3.99	0.26	0.16	0.61
		Circle	0.4	18.3	0.8	0.7	5.3	0.3	13.9	0.6	0.6	4.0	0.06	3.15	0.13	0.13	0.90
	GCA Box	Approach	0.0	1.6	0.1	0.1	0.5	0.0	1.3	0.1	0.1	0.4	0.00	0.26	0.01	0.01	0.07
		Climbout	0.0	1.4	0.1	0.1	0.2	0.0	1.1	0.1	0.0	0.2	0.00	0.22	0.01	0.01	0.03
		Circle	0.0	2.3	0.1	0.1	0.7	0.0	1.9	0.1	0.1	0.5	0.01	0.38	0.02	0.02	0.11
E-2 below 3,000 feet			26.0	129.1	38.7	5.4	32.4	19.6	97.8	29.2	4.1	24.5	4.53	22.10	6.73	0.93	5.55

TABLE D-15. ESTIMATED EMISSIONS FROM ADDED E-2 FLIGHT OPERATIONS

Notes:

FLCP = field carrier landing practice

ACLS = automated carrier landing system

GCA = ground controlled approach

G Idle 1 = low speed ground idle

Data used to develop emission estimates are presented in Table D-14.

Typical day operations assume 80% of annual operations during spring through fall (274 days) and 20% of annual operations during winter (91 days).

All values independently rounded for display after calculation.

Data Sources:

ATAC Corporation. 1997. NAS Lemoore F/A-18E/F Introduction and E-2 Realignment Airfield and Airspace Operational Study. Draft Report.

Huber, Derek. 1998. 3-10-98 E-Mail, E-2 Operations Data. Sent by Derek Huber, ATAC Corporation, to Kelly Knight, Southwest Division Naval Facilities Engineering Command.

U.S. Navy, 1990. Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines (AESO Report No. 6-90).

U.S. Environmental Protection Agency, 1992. Procedures for Emission Inventory Preparation. Volume IV: Mobile Sources (EPA-450/4-81-026d(revised)).

Wyle Research, 1994. Aircraft Noise Study for Naval Air Station Lemoore, California (WR 94-17).

TABLE D-16. ESTIMATED EMISSIONS FROM E-2 ENGINE IN-FRAME AND TEST STAND RUN-UPS

Run-Up Type	Engine Models Used For Emissions Analysis	Annual Run-Up Events	Engine Mode.	Time In Mode (minutes)	Fuel Flow Rate per Engine (lb/hr)	Modal Emission Rate (pounds per 1,000 pounds fuel flow): Total Organics	Nitrogen Oxides	Carbon Monoxide	Sulfur Oxides	Particulate Matter		Total Emissions from Annual Engine Ru-Ups (tons/year): Reactive Organics	Nitrogen Oxides	Carbon Monoxide	Sulfur Oxides	Particulate Matter
In-Frame, Long Test	T56-A-16, T56-A-7	826	G Idle 1	10	599	22.32	3.53	30.11	0.40	2.92		0.92	0.15	1.24	0.02	0.12
			75%	15	1,996	0.19	9.93	0.42	0.40	2.85		0.04	2.05	0.09	0.08	0.59
			Military	5	2,219	0.16	10.45	0.65	0.40	1.78		0.01	0.80	0.05	0.03	0.14
											Subtotal:	0.97	2.99	1.38	0.13	0.84
In-Frame, Short Test	T56-A-16, T56-A-7	208	G Idle 1	8	599	22.32	3.53	30.11	0.40	2.92		0.19	0.03	0.25	0.00	0.02
			F Idle	8	836	1.10	6.52	4.54	0.40	2.92		0.01	0.08	0.05	0.00	0.03
			75%	2	1,996	0.19	9.93	0.42	0.40	2.85		0.00	0.07	0.00	0.00	0.02
			100%	1.6	2,136	0.14	10.29	0.68	0.40	1.57		0.00	0.06	0.00	0.00	0.01
			Military	0.4	2,219	0.16	10.45	0.65	0.40	1.78		0.00	0.02	0.00	0.00	0.00
											Subtotal:	0.20	0.25	0.31	0.01	0.09
Test Stand	T56-A-16, T56-A-7	312	F Idle	10	836	1.10	6.52	4.54	0.40	2.92		0.02	0.14	0.10	0.01	0.06
			75%	15	1,996	0.19	9.93	0.42	0.40	2.85		0.01	0.77	0.03	0.03	0.22
			100%	10	2,136	0.14	10.29	0.68	0.40	1.57		0.01	0.57	0.04	0.02	0.09
			Military	5	2,219	0.16	10.45	0.65	0.40	1.78		0.00	0.30	0.02	0.01	0.05
											Subtotal:	0.05	1.79	0.19	0.07	0.42
Total In-Frame Run-Ups											In-Frame:	1.17	3.24	1.69	0.14	0.93
Combined In-Frame Run-Ups and Test Stand											Total:	1.22	5.03	1.88	0.22	1.36

Notes:

In-frame long test engine run-ups: 2.15 tests per engine per aircraft per month (MCAS Miramar Conformity Analysis, Volume I, Table B-5: 1990 test rate).

In-frame short test engine run-ups: 13 single engine tests per aircraft per year (MCAS Miramar Conformity Analysis, Volume II, Table B-1: 1990 test rate).

In-frame run-up time-in-mode data from MCAS Miramar Conformity Analysis (Volume I, Table B-5; Volume I, Table B-1).

Test stand run-ups: based on 6 engine tests per week (E-2 engines plus additional T-56 engines from MCAS Miramar KC-130 aircraft).

Test stand time-in-mode: similar to in-frame long test, except flight idle substituted for ground idle and 10 minutes at 100% setting added.

Miscellaneous Mobile and Stationary Sources

TABLE D-17. SUPPORT EQUIPMENT FOR E-2 SQUADRONS

MODEL ID	TEC	AMOUNT	FUEL	ENGINE SIZE	ITEM DESCRIPTION	PURPOSE OR USE OF ITEM	CUMULATIVE ANNUAL USE ESTIMATE (HOURS PER YEAR)
NC-10C MEPP	GAHB	8	Diesel	220 hp	Towable generator (120/220Vac, 28Vdc)	For starting and maintaining aircraft	Standby only
NC-8A1 MEPP	GAHJ	11	JP fuel	118 hp	Vehicle-mounted generator (120/220Vac, 28Vdc)	For starting and maintaining aircraft	Standby only
A/M47A-4	GBPD	12	JP fuel	200 hp (?)	Towable air start unit (28Vdc)	Electrical power and air for starting aircraft engines	Standby only
A/M32C-17	GEC4	4	Diesel	215 hp	Air conditioning unit	Air for cooling and ventilating aircraft cockpit or electrical equipment	Standby only
ACU-20/M	GFBW	4	Diesel	20 hp	Air compressor	Used with portable air conditioning unit	Standby only
A/M27T-5	GGJ4	5	Diesel	95 hp	Hydraulic test stand	For service and maintenance of aircraft hydraulic systems	585 hours per year
A/M42M-2	GPBJ	12	Gasoline	8 hp	Floodlight set	Emergency or temporary lighting and 120Vac or 28Vdc power	Standby only
TA-75	GPC1	13	Gasoline	210 hp	Tow tractor	Moving aircraft and towable equipment	1,300 hours per year
A/S32A-30A	GPCW	8	Diesel	164 hp	Tow tractor	Moving aircraft and towable equipment	1,300 hours per year

Equipment identifications and use data provided by Navy personnel at COMNAVAIRPAC, COMAEWWINGPAC, and NAWS Point Mugu.

TABLE D-18. EMISSION ESTIMATES FOR AIRCRAFT SUPPORT EQUIPMENT

Equipment Type	Engine Fuel	Typical In-use HP Load	Cumulative Annual Use Estimate (total hrs)	Emission Rate (grams per horsepower-hour) Total Organics	Nitrogen Oxides	Carbon Monoxide	Sulfur Oxides	Particulate Matter	Total Emissions from Annual Equipment Use (tons/year) Reactive Organics	Nitrogen Oxides	Carbon Monoxide	Sulfur Oxides	Particulate Matter
TA-75 Tow Tractors (210 hp)	Gasoline	84	1,300	12.22	5.16	258.70	0.27	0.06	1.47	0.62	31.14	0.03	0.01
A/S32A Tow Tractors (164 hp)	Diesel	66	1,300	1.60	14.00	6.06	0.93	1.60	0.15	1.32	0.57	0.09	0.15
A/M27T-5 Hydraulic Test Stand (95 hp)	Diesel	71	585	1.14	14.06	3.03	0.93	1.00	0.05	0.64	0.14	0.04	0.05
Standby Equipment Testing/Use (220 hp typical size)	Diesel	88	144	1.14	14.06	3.03	0.93	1.00	0.02	0.20	0.04	0.01	0.01
TOTALS								TOTAL:	1.69	2.79	31.89	0.18	0.22

Notes:

hp = horsepower

Equipment identifications, engine sizes, fuel types, and use data provided by Navy personnel (COMNAVAIRPAC, COMAEWWINGPAC, and NAWS Point Mugu).

TA-75 tow tractor use estimated by Navy personnel to be 10 hours per week per on-base squadron.

A/S32A tow tractor use assumed to be equivalent to TA-75 tow tractor use.

A/M27T hydraulic test stand use estimated by Navy personnel to be 4.5 hours per week per on-base squadron.

Squadron deployment cycles will result in an annual average of 2.5 on-base squadrons over the course of a year.

In use horsepower load values rounded from rated horsepower times typical load factors of 75% for hydraulic test stands and 40% for other items.

Testing and use of standby equipment (generators, compressors, air start units, etc.) assumed to be equivalent to twelve 220 hp engines used 1 hour per month at 40% load.

Emission factors for tow tractors are from U.S. Environmental Protection Agency 1991.

Gasoline-fueled tow tractor emission factors reflect EPA in-use adjustments.

Portable and standby equipment diesel engine emission factors are from U.S. Environmental Protection Agency 1995, Section 3.3.

Data Source:

U.S. EPA 1991. Nonroad Engine and Vehicle Emission Study - Report. (ANR-443). NITS PB92126960.

U.S. EPA 1995. Compilation of Air Pollutant Emission Factors. 5th Edition. Volume I: Stationary Point and Area Sources. (AP-42).

TABLE D-19. EMISSION RATES FOR MISCELLANEOUS STATIONARY AND AREA SOURCES

SOURCE CATEGORY	TYPICAL SIZE OR QUANTITY	SIZE UNITS	STANDARD EMISSION FACTORS					EMISSION FACTOR UNITS	EMISSION FACTOR DATA SOURCE
			ROG	NOx	CO	SOx	PM10		
JP-5 AIRCRAFT FUEL TRANSFERS, 40 F	1	MILLION GALLONS	19.26	0.00	0.00	0.00	0.00	LBS/MILLION GAL	AP-42, SECT 5.2 & 7.1; 40 DEG F
JP-5 AIRCRAFT FUEL TRANSFERS, 50 F	1	MILLION GALLONS	27.63	0.00	0.00	0.00	0.00	LBS/MILLION GAL	AP-42, SECT 5.2 & 7.1; 50 DEG F
JP-5 AIRCRAFT FUEL TRANSFERS, 60 F	1	MILLION GALLONS	38.39	0.00	0.00	0.00	0.00	LBS/MILLION GAL	AP-42, SECT 5.2 & 7.1; 60 DEG F
JP-5 AIRCRAFT FUEL TRANSFERS, 70 F	1	MILLION GALLONS	48.75	0.00	0.00	0.00	0.00	LBS/MILLION GAL	AP-42, SECT 5.2 & 7.1; 70 DEG F
JP-5 AIRCRAFT FUEL TRANSFERS, 80 F	1	MILLION GALLONS	65.24	0.00	0.00	0.00	0.00	LBS/MILLION GAL	AP-42, SECT 5.2 & 7.1; 80 DEG F
JP-5 AIRCRAFT FUEL TRANSFERS, 90 F	1	MILLION GALLONS	89.68	0.00	0.00	0.00	0.00	LBS/MILLION GAL	AP-42, SECT 5.2 & 7.1; 90 DEG F
JP-5 AIRCRAFT FUEL TRANSFERS, 100 F	1	MILLION GALLONS	121.63	0.00	0.00	0.00	0.00	LBS/MILLION GAL	AP-42, SECT 5.2 & 7.1; 100 DEG F
NATURAL GAS BOILER, HANGAR	6.3	MILLION BTU/HR	3.83	81.00	61.00	0.60	12.00	LBS/MILLION SCF	AP-42, SECT 1.4 (<10 MMBTU, LOW NOx)
NATURAL GAS BOILER, BEQ	8.4	MILLION BTU/HR	3.83	81.00	61.00	0.60	12.00	LBS/MILLION SCF	AP-42, SECT 1.4 (<10 MMBTU, LOW NOx)
OFFICE/SHOP BLDG NATURAL GAS USE	1	MILLION BTU/HR	3.83	81.00	61.00	0.60	12.00	LBS/MILLION SCF	AP-42, SECT 1.4 (<10 MMBTU, LOW NOx)
RESIDENTIAL NATURAL GAS USE	<0.3	MILLION BTU/HR	7.26	94.00	40.00	0.60	11.18	LBS/MILLION SCF	AP-42, SECT 1.4 (<0.3 MMBTU)
AIRCRAFT PAINTING	3.4	GALLONS/YR/PLANE	3.51	0.00	0.00	0.00	0.00	LBS/GAL PAINT	ASSUME 420 GRAMS VOC/LITER
SOLVENT USE	1.8	GALLONS/YR/PLANE	7.36	0.00	0.00	0.00	0.00	LBS/GAL SOLVENT	ASSUME 7.36 LB/GALLON, 100% VOLATILE
ABRASIVE BLASTING	67.3	POUNDS/YR/PLANE	0.00	0.00	0.00	0.00	0.01	LBS/LB ABRASIVE	NAS LEMOORE TITLE V ASSUMPTION

TABLE D-20. MISCELLANEOUS EMISSION SOURCES, NAWS POINT MUGU ALTERNATIVE

	USE INDEX		ANNUAL EMISSIONS, TONS/YEAR					
SOURCE CATEGORY	AMOUNT	UNITS	ROG	NOx	CO	SOx	PM10	USE RATE ASSUMPTIONS
1. JP-5 AIRCRAFT FUEL TRANSFERS, 50 F	2.05	MILLION GAL/YEAR	0.028	0.000	0.000	0.000	0.000	1.025 MILLION GAL, 2 TRANSFERS, 50 DEG F
2. JP-5 AIRCRAFT FUEL TRANSFERS, 60 F	6.15	MILLION GAL/YEAR	0.118	0.000	0.000	0.000	0.000	3.075 MILLION GAL, 2 TRANSFERS, 60 DEG F
3. NATURAL GAS USE, OFFICE/INDUSTRIAL	1.72	MILLION SCF/YEAR	0.003	0.070	0.052	0.001	0.010	10 BTU/HR/SF, 1000 BTU/SCF
4. NATURAL GAS USE, OFF-BASE HOUSING	199.27	MILLION SCF/DU/YEAR	0.723	9.365	3.985	0.060	1.114	24 BTU/HR/SF, 1400 SF/DU, 1000 BTU/SCF
5. AIRCRAFT PAINTING	54.4	GALLONS/YEAR	0.095	0.000	0.000	0.000	0.000	TITLE V TRACKING REPORT, NAS LEMOORE
6. SOLVENT USE	28.8	GALLONS/YEAR	0.106	0.000	0.000	0.000	0.000	TITLE V TRACKING REPORT, NAS LEMOORE
7. ABRASIVE BLASTING	1,077	POUNDS/YEAR	0.000	0.000	0.000	0.000	0.005	TITLE V TRACKING REPORT, NAS LEMOORE
AIRCRAFT REFUELING (1 & 2; CONFORMITY-RELATED)			0.146	0.000	0.000	0.000	0.000	
ON-BASE NON-PERMIT NATURAL GAS USE (3; CONFORMITY-RELATED)			0.003	0.070	0.052	0.001	0.010	
ON-BASE PERMIT SOURCES (5 - 7; EXEMPT FROM CONFORMITY)			0.201	0.000	0.000	0.000	0.005	
OFF-BASE HOUSING NATURAL GAS USE (4; EXEMPT FROM CONFORMITY)			0.723	9.365	3.985	0.060	1.114	

TABLE D-21. MISCELLANEOUS EMISSION SOURCES, NAS LEMOORE ALTERNATIVE

SOURCE CATEGORY	USE INDEX AMOUNT	USE INDEX UNITS	ANNUAL EMISSIONS, TONS/YEAR ROG	NOx	CO	SOx	PM10	USE RATE ASSUMPTIONS
1. JP-5 AIRCRAFT FUEL TRANSFERS, 40 F	0.68	MILLION GAL/YEAR	0.007	0.000	0.000	0.000	0.000	0.342 MILLION GAL, 2 TRANSFERS, 40 DEG F
2. JP-5 AIRCRAFT FUEL TRANSFERS, 50 F	2.73	MILLION GAL/YEAR	0.038	0.000	0.000	0.000	0.000	1.367 MILLION GAL, 2 TRANSFERS, 50 DEG F
3. JP-5 AIRCRAFT FUEL TRANSFERS, 60 F	0.68	MILLION GAL/YEAR	0.013	0.000	0.000	0.000	0.000	0.342 MILLION GAL, 2 TRANSFERS, 60 DEG F
4. JP-5 AIRCRAFT FUEL TRANSFERS, 70 F	2.73	MILLION GAL/YEAR	0.067	0.000	0.000	0.000	0.000	1.367 MILLION GAL, 2 TRANSFERS, 70 DEG F
5. JP-5 AIRCRAFT FUEL TRANSFERS, 80 F	1.37	MILLION GAL/YEAR	0.045	0.000	0.000	0.000	0.000	0.683 MILLION GAL, 2 TRANSFERS, 80 DEG F
6. NATURAL GAS BOILER, HANGAR	13.80	MILLION SCF/YEAR	0.026	0.559	0.421	0.004	0.083	25% OF RATED CAPACITY
7. NATURAL GAS BOILER, BEQ	18.40	MILLION SCF/YEAR	0.035	0.745	0.561	0.006	0.110	25% OF RATED CAPACITY
8. NATURAL GAS USE, OFFICE/INDUSTRIAL	9.37	MILLION SCF/YEAR	0.018	0.380	0.286	0.003	0.056	10 BTU/HR/SF, 1000 BTU/SCF
9. NATURAL GAS USE, OFF-BASE HOUSING	199.27	MILLION SCF/DU/YEAR	0.723	9.365	3.985	0.060	1.114	24 BTU/HR/SF, 1400 SF/DU, 1000 BTU/SCF
10. AIRCRAFT PAINTING	54.4	GALLONS/YEAR	0.095	0.000	0.000	0.000	0.000	TITLE V TRACKING REPORT, NAS LEMOORE
11. SOLVENT USE	28.8	GALLONS/YEAR	0.106	0.000	0.000	0.000	0.000	TITLE V TRACKING REPORT, NAS LEMOORE
12. ABRASIVE BLASTING	1,077	POUNDS/YEAR	0.000	0.000	0.000	0.000	0.005	TITLE V TRACKING REPORT, NAS LEMOORE
AIRCRAFT REFUELING (1 - 5; CONFORMITY-RELATED)			0.169	0.000	0.000	0.000	0.000	
ON-BASE NON-PERMIT NATURAL GAS USE (8; CONFORMITY-RELATED)			0.018	0.380	0.286	0.003	0.056	
ON-BASE PERMIT SOURCES (6 - 7 & 10 - 12; EXEMPT FROM CONFORMITY)			0.263	1.304	0.982	0.010	0.199	
OFF-BASE HOUSING NATURAL GAS USE (9; EXEMPT FROM CONFORMITY)			0.723	9.365	3.985	0.060	1.114	

TABLE D-22. MISCELLANEOUS EMISSION SOURCES, NAF EL CENTRO ALTERNATIVE

SOURCE CATEGORY	USE INDEX		ANNUAL EMISSIONS, TONS/YEAR					USE RATE ASSUMPTIONS
	AMOUNT	UNITS	ROG	NOx	CO	SOx	PM10	
1. JP-5 AIRCRAFT FUEL TRANSFERS, 60 F	3.42	MILLION GAL/YEAR	0.066	0.000	0.000	0.000	0.000	1.708 MILLION GAL, 2 TRANSFERS, 60 DEG F
2. JP-5 AIRCRAFT FUEL TRANSFERS, 70 F	0.68	MILLION GAL/YEAR	0.017	0.000	0.000	0.000	0.000	0.342 MILLION GAL, 2 TRANSFERS, 70 DEG F
3. JP-5 AIRCRAFT FUEL TRANSFERS, 80 F	1.37	MILLION GAL/YEAR	0.045	0.000	0.000	0.000	0.000	0.683 MILLION GAL, 2 TRANSFERS, 80 DEG F
4. JP-5 AIRCRAFT FUEL TRANSFERS, 90 F	2.73	MILLION GAL/YEAR	0.123	0.000	0.000	0.000	0.000	1.367 MILLION GAL, 2 TRANSFERS, 90 DEG F
5. NATURAL GAS BOILER, HANGAR	13.80	MILLION SCF/YEAR	0.026	0.559	0.421	0.004	0.083	25% OF RATED CAPACITY
6. NATURAL GAS BOILER, BEQ	18.40	MILLION SCF/YEAR	0.035	0.745	0.561	0.006	0.110	25% OF RATED CAPACITY
7. NATURAL GAS USE, OFFICE/INDUSTRIAL	14.38	MILLION SCF/YEAR	0.028	0.582	0.439	0.004	0.086	10 BTU/HR/SF, 1000 BTU/SCF
8. NATURAL GAS USE, OFF-BASE HOUSING	199.27	MILLION SCF/DU/YEAR	0.723	9.365	3.985	0.060	1.114	24 BTU/HR/SF, 1400 SF/DU, 1000 BTU/SCF
9. AIRCRAFT PAINTING	54.4	GALLONS/YEAR	0.095	0.000	0.000	0.000	0.000	TITLE V TRACKING REPORT, NAS LEMOORE
10. SOLVENT USE	28.8	GALLONS/YEAR	0.106	0.000	0.000	0.000	0.000	TITLE V TRACKING REPORT, NAS LEMOORE
11. ABRASIVE BLASTING	1,077	POUNDS/YEAR	0.000	0.000	0.000	0.000	0.005	TITLE V TRACKING REPORT, NAS LEMOORE
AIRCRAFT REFUELING (1 - 4; CONFORMITY-RELATED)			0.249	0.000	0.000	0.000	0.000	
ON-BASE NON-PERMIT NATURAL GAS USE (7; CONFORMITY-RELATED)			0.028	0.582	0.439	0.004	0.086	
ON-BASE PERMIT SOURCES (5 - 6 & 9 - 11; EXEMPT FROM CONFORMITY)			0.263	1.304	0.982	0.010	0.199	
OFF-BASE HOUSING NATURAL GAS USE (8; EXEMPT FROM CONFORMITY)			0.723	9.365	3.985	0.060	1.114	

Vehicles Use Parameters, On-base Housing

TABLE D-23. GENERALIZED VEHICLE TRAVEL TIME PATTERNS AND OPERATING MODES FOR ON-BASE HOUSING

TRIP TYPE	PORTION OF TOTAL TRIPS	DISTRIBUTION OF TRAVEL BY TRIP DURATION INTERVALS										
		UNDER 8 MINUTES	8 - 10 MINUTES	10 - 15 MINUTES	15 - 20 MINUTES	20 - 25 MINUTES	25 - 30 MINUTES	30 - 35 MINUTES	35 - 40 MINUTES	40 - 45 MINUTES	45 - 50 MINUTES	OVER 50 MINUTES
H-W	30.00%	45.00%	30.00%	20.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
H-S	35.00%	50.00%	20.00%	15.00%	5.00%	3.00%	2.00%	1.00%	1.00%	1.00%	1.00%	1.00%
H-O	35.00%	20.00%	15.00%	25.00%	15.00%	10.00%	7.00%	3.00%	2.00%	1.00%	1.00%	1.00%
SUM/MEAN	100.00%	38.00%	21.25%	20.00%	7.00%	4.55%	3.15%	1.40%	1.05%	0.70%	0.70%	0.70%

CUMULATIVE TRIP OPERATING MODES (FOR TOTAL EMISSIONS ANALYSES):

TRIP TYPE	MEAN TRAVEL TIME (MINUTES)	MEAN COLD START MODE	MEAN HOT START MODE	MEAN HOT STABLE MODE	NONCAT COLD START MODE	NONCAT HOT START MODE	CATALYST COLD START MODE	CATALYST HOT START MODE
H-W	7.68	84.65%	7.22%	8.13%	73.54%	18.34%	85.10%	6.77%
H-S	10.78	43.90%	40.30%	15.81%	28.30%	55.90%	44.53%	39.66%
H-O	15.65	44.46%	21.53%	34.01%	28.63%	37.36%	45.11%	20.89%
MEANS	11.55	56.32%	23.81%	19.87%	41.98%	38.14%	56.90%	23.22%

TABLE D-24. EMFAC7F INPUT ASSUMPTIONS FOR NAWS PT MUGU HOUSING TRIPS

SUMMARY OF INPUT ASSUMPTIONS:

CALENDAR YEAR: 1999 I&M PROGRAM: YES

VEHICLE MIX ASSUMPTIONS:

LDA	LDT	MDT	HDG	HDD	BUS	MCY
70.94%	25.50%	2.52%	0.00%	0.00%	0.00%	1.04%

AIR TEMPERATURE FOR EXHAUST RATES, SUMMER: 60 WINTER: 50

EVAPORATIVE EMISSIONS TEMPERATURE PATTERNS:

	MINIMUM	8 AM	9 AM	11 AM	1 PM	MAXIMUM
SUMMER	55	57	59	65	68	70
WINTER	45	45	47	54	60	62

OPERATING MODE ASSUMPTIONS BY TRIP TYPE:

	COLD START	HOT START	HOT STABLE	3-CATEGORY MIX BASIS: WORK	SHOP	OTHER
H-W	84.65%	7.22%	8.13%	100.0%	0.0%	0.0%
H-S	43.90%	40.30%	15.80%	0.0%	100.0%	0.0%
H-O	44.46%	21.53%	34.01%	0.0%	0.0%	100.0%
O-W	39.94%	24.70%	35.36%	0.0%	0.0%	0.0%
O-O	22.55%	57.72%	19.73%	0.0%	0.0%	0.0%
WORK	84.65%	7.22%	8.13%			
SHOP	43.90%	40.30%	15.80%			
OTHER	44.46%	21.53%	34.01%			

NOTES:
LDA = light duty autos
LDT = light duty trucks
MDT = medium duty trucks
HDG = heavy duty gasoline-fueled vehicles
HDD = heavy duty diesel-fueled vehicles
BUS = diesel-fueled urban buses
MCY = motorcycles
H-W = home-work trips
H-S = home-shopping trips
H-O = home-other trips
O-W = other-work trips
O-O = other-other trips
WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)

TABLE D-25. 1999 EMISSION RATES FOR NAWS PT MUGU HOUSING TRIPS

POL-LUTANT	TRIP PURPOSE	GRAM/MILE RATES BY SPEED IN MPH 15	25	35	45	55
ROG	WORK	2.18	1.87	1.76	1.68	1.68
	SHOP	1.57	1.26	1.15	1.07	1.08
	OTHER	1.54	1.23	1.12	1.04	1.05
NOx	WORK	1.41	1.22	1.22	1.35	1.67
	SHOP	1.26	1.07	1.06	1.19	1.51
	OTHER	1.18	0.99	0.98	1.12	1.43
CO-S	WORK	22.56	20.45	19.50	19.06	19.58
	SHOP	15.64	13.53	12.58	12.14	12.67
	OTHER	15.22	13.11	12.16	11.72	12.24
CO-W	WORK	27.68	25.30	24.23	23.73	24.28
	SHOP	17.96	15.58	14.51	14.01	14.56
	OTHER	17.93	15.55	14.47	13.97	14.53
PMEX	WORK	0.01	0.01	0.01	0.01	0.01
	SHOP	0.01	0.01	0.01	0.01	0.01
	OTHER	0.01	0.01	0.01	0.01	0.01
PMTW	WORK	0.20	0.20	0.20	0.20	0.20
	SHOP	0.20	0.20	0.20	0.20	0.20
	OTHER	0.20	0.20	0.20	0.20	0.20

	SOAK	DRNL/RSTL	ROAD DUST
WORK	0.50	3.54	2.90
SHOP	0.50	3.54	2.90
OTHER	0.50	3.54	2.90

NOTES: WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)
ROG = reactive organic gases (summer fuel volatility)
NOx = oxides of nitrogen (summer fuel volatility)
CO-S = carbon monoxide (summer fuel volatility)
CO-W = carbon monoxide (winter fuel volatility)
PMEX = exhaust particulate matter
PMTW = tire wear particulate matter
DRNL = diurnal evaporative emissions (grams/veh-day)
RSTL = resting loss evaporative emissions (g/veh-day)
SOAK = hot soak emission rate in grams/trip
ROAD DUST = resuspended road dust (PM10 grams/vmt)

TABLE D-26. EMFAC7F INPUT ASSUMPTIONS FOR NAS LEMOORE HOUSING TRIPS

SUMMARY OF INPUT ASSUMPTIONS:

CALENDAR YEAR: 1999 I&M PROGRAM: YES

VEHICLE MIX ASSUMPTIONS:

LDA	LDT	MDT	HDG	HDD	BUS	MCY
70.94%	25.50%	2.52%	0.00%	0.00%	0.00%	1.04%

AIR TEMPERATURE FOR EXHAUST RATES, SUMMER: 85 WINTER: 40

EVAPORATIVE EMISSIONS TEMPERATURE PATTERNS:

	MINIMUM	8 AM	9 AM	11 AM	1 PM	MAXIMUM
SUMMER	60	64	70	86	94	100
WINTER	35	35	37	43	49	50

OPERATING MODE ASSUMPTIONS BY TRIP TYPE:

	COLD START	HOT START	HOT STABLE	3-CATEGORY MIX BASIS: WORK	SHOP	OTHER
H-W	84.65%	7.22%	8.13%	100.0%	0.0%	0.0%
H-S	43.90%	40.30%	15.80%	0.0%	100.0%	0.0%
H-O	44.46%	21.53%	34.01%	0.0%	0.0%	100.0%
O-W	39.94%	24.70%	35.36%	0.0%	0.0%	0.0%
O-O	22.55%	57.72%	19.73%	0.0%	0.0%	0.0%
WORK	84.65%	7.22%	8.13%			
SHOP	43.90%	40.30%	15.80%			
OTHER	44.46%	21.53%	34.01%			

NOTES:
LDA = light duty autos
LDT = light duty trucks
MDT = medium duty trucks
HDG = heavy duty gasoline-fueled vehicles
HDD = heavy duty diesel-fueled vehicles
BUS = diesel-fueled urban buses
MCY = motorcycles
H-W = home-work trips
H-S = home-shopping trips
H-O = home-other trips
O-W = other-work trips
O-O = other-other trips
WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)

TABLE D-27. 1999 EMISSION RATES FOR NAS LEMOORE HOUSING TRIPS

POL-LUTANT	TRIP PURPOSE	GRAM/MILE RATES BY SPEED IN MPH 15	25	35	45	55
ROG	WORK	1.88	1.31	1.15	1.06	1.09
	SHOP	1.59	1.02	0.85	0.76	0.79
	OTHER	1.56	0.99	0.82	0.73	0.76
NOx	WORK	1.25	1.08	1.07	1.19	1.48
	SHOP	1.10	0.93	0.92	1.04	1.33
	OTHER	1.04	0.87	0.86	0.98	1.26
CO-S	WORK	14.84	12.65	11.67	11.21	11.74
	SHOP	11.77	9.58	8.59	8.14	8.67
	OTHER	11.28	9.09	8.11	7.65	8.18
CO-W	WORK	32.88	30.27	29.09	28.54	29.16
	SHOP	20.98	18.37	17.19	16.63	17.26
	OTHER	20.98	18.37	17.19	16.64	17.26
PMEX	WORK	0.01	0.01	0.01	0.01	0.01
	SHOP	0.01	0.01	0.01	0.01	0.01
	OTHER	0.01	0.01	0.01	0.01	0.01
PMTW	WORK	0.20	0.20	0.20	0.20	0.20
	SHOP	0.20	0.20	0.20	0.20	0.20
	OTHER	0.20	0.20	0.20	0.20	0.20

	SOAK	DRNL/RSTL	ROAD DUST
WORK	0.50	6.43	2.90
SHOP	0.50	6.43	2.90
OTHER	0.50	6.43	2.90

NOTES: WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)
ROG = reactive organic gases (summer fuel volatility)
NOx = oxides of nitrogen (summer fuel volatility)
CO-S = carbon monoxide (summer fuel volatility)
CO-W = carbon monoxide (winter fuel volatility)
PMEX = exhaust particulate matter
PMTW = tire wear particulate matter
DRNL = diurnal evaporative emissions (grams/veh-day)
RSTL = resting loss evaporative emissions (g/veh-day)
SOAK = hot soak emission rate in grams/trip
ROAD DUST = resuspended road dust (PM10 grams/vmt)

TABLE D-28. EMFAC7F INPUT ASSUMPTIONS FOR NAF EL CENTRO HOUSING TRIPS

SUMMARY OF INPUT ASSUMPTIONS:

CALENDAR YEAR: 1999 I&M PROGRAM: YES

VEHICLE MIX ASSUMPTIONS:

LDA	LDT	MDT	HDG	HDD	BUS	MCY
70.94%	25.50%	2.52%	0.00%	0.00%	0.00%	1.04%

AIR TEMPERATURE FOR EXHAUST RATES, SUMMER: 90 WINTER: 60

EVAPORATIVE EMISSIONS TEMPERATURE PATTERNS:

	MINIMUM	8 AM	9 AM	11 AM	1 PM	MAXIMUM
SUMMER	78	81	85	96	101	105
WINTER	45	45	48	59	68	70

OPERATING MODE ASSUMPTIONS BY TRIP TYPE:

	COLD START	HOT START	HOT STABLE	3-CATEGORY MIX BASIS: WORK	SHOP	OTHER
H-W	84.65%	7.22%	8.13%	100.0%	0.0%	0.0%
H-S	43.90%	40.30%	15.80%	0.0%	100.0%	0.0%
H-O	44.46%	21.53%	34.01%	0.0%	0.0%	100.0%
O-W	39.94%	24.70%	35.36%	0.0%	0.0%	0.0%
O-O	22.55%	57.72%	19.73%	0.0%	0.0%	0.0%
WORK	84.65%	7.22%	8.13%			
SHOP	43.90%	40.30%	15.80%			
OTHER	44.46%	21.53%	34.01%			

NOTES: LDA = light duty autos
LDT = light duty trucks
MDT = medium duty trucks
HDG = heavy duty gasoline-fueled vehicles
HDD = heavy duty diesel-fueled vehicles
BUS = diesel-fueled urban buses
MCY = motorcycles
H-W = home-work trips
H-S = home-shopping trips
H-O = home-other trips
O-W = other-work trips
O-O = other-other trips
WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)

TABLE D-29. 1999 EMISSION RATES FOR NAF EL CENTRO HOUSING TRIPS

POL-LUTANT	TRIP PURPOSE	GRAM/MILE RATES BY SPEED IN MPH 15	25	35	45	55
ROG	WORK	1.99	1.33	1.14	1.05	1.08
	SHOP	1.72	1.05	0.87	0.77	0.81
	OTHER	1.68	1.02	0.84	0.74	0.78
NOx	WORK	1.25	1.08	1.07	1.19	1.48
	SHOP	1.10	0.93	0.92	1.05	1.34
	OTHER	1.04	0.87	0.86	0.98	1.27
CO-S	WORK	15.16	12.83	11.79	11.30	11.87
	SHOP	12.26	9.93	8.88	8.40	8.96
	OTHER	11.70	9.37	8.33	7.84	8.41
CO-W	WORK	22.46	20.25	19.25	18.79	19.30
	SHOP	15.01	12.80	11.81	11.34	11.85
	OTHER	14.95	12.74	11.74	11.28	11.79
PMEX	WORK	0.01	0.01	0.01	0.01	0.01
	SHOP	0.01	0.01	0.01	0.01	0.01
	OTHER	0.01	0.01	0.01	0.01	0.01
PMTW	WORK	0.20	0.20	0.20	0.20	0.20
	SHOP	0.20	0.20	0.20	0.20	0.20
	OTHER	0.20	0.20	0.20	0.20	0.20

	SOAK	DRNL/RSTL	ROAD DUST
WORK	0.50	8.11	2.90
SHOP	0.50	8.11	2.90
OTHER	0.50	8.11	2.90

NOTES: WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)
ROG = reactive organic gases (summer fuel volatility)
NOx = oxides of nitrogen (summer fuel volatility)
CO-S = carbon monoxide (summer fuel volatility)
CO-W = carbon monoxide (winter fuel volatility)
PMEX = exhaust particulate matter
PMTW = tire wear particulate matter
DRNL = diurnal evaporative emissions (grams/veh-day)
RSTL = resting loss evaporative emissions (g/veh-day)
SOAK = hot soak emission rate in grams/trip
ROAD DUST = resuspended road dust (PM10 grams/vmt)

Vehicles Use Parameters, Off-base Housing

TABLE D-30. VEHICLE TRAVEL TIME PATTERNS AND OPERATING MODES. OFF-BASE HOUSING AT NAWS POINT MUGU

TRIP TYPE	PORTION OF TOTAL TRIPS	DISTRIBUTION OF TRAVEL BY TRIP DURATION INTERVALS										
		UNDER 8 MINUTES	8 - 10 MINUTES	10 - 15 MINUTES	15 - 20 MINUTES	20 - 25 MINUTES	25 - 30 MINUTES	30 - 35 MINUTES	35 - 40 MINUTES	40 - 45 MINUTES	45 - 50 MINUTES	OVER 50 MINUTES
H-W	25.00%	15.00%	10.00%	25.00%	15.00%	12.00%	10.00%	6.00%	4.00%	1.00%	1.00%	1.00%
H-S	37.50%	45.00%	20.00%	13.00%	10.00%	5.00%	2.00%	1.00%	1.00%	1.00%	1.00%	1.00%
H-O	37.50%	20.00%	15.00%	25.00%	15.00%	10.00%	7.00%	3.00%	2.00%	1.00%	1.00%	1.00%
SUM/MEAN	100.00%	28.13%	15.63%	20.50%	13.13%	8.63%	5.88%	3.00%	2.13%	1.00%	1.00%	1.00%

CUMULATIVE TRIP OPERATING MODES (FOR TOTAL EMISSIONS ANALYSES):

TRIP TYPE	MEAN TRAVEL TIME (MINUTES)	MEAN COLD START MODE	MEAN HOT START MODE	MEAN HOT STABLE MODE	NONCAT COLD START MODE	NONCAT HOT START MODE	CATALYST COLD START MODE	CATALYST HOT START MODE
H-W	17.93	54.52%	4.65%	40.83%	47.36%	11.81%	54.81%	4.36%
H-S	11.58	42.23%	38.77%	19.00%	27.23%	53.78%	42.84%	38.16%
H-O	15.65	44.46%	21.53%	34.01%	28.63%	37.36%	45.11%	20.89%
MEANS	14.69	46.14%	23.78%	30.08%	32.79%	37.13%	46.68%	23.23%

TABLE D-31. VEHICLE TRAVEL TIME PATTERNS AND OPERATING MODES. OFF-BASE HOUSING AT NAS LEMOORE

TRIP TYPE	PORTION OF TOTAL TRIPS	DISTRIBUTION OF TRAVEL BY TRIP DURATION INTERVALS: UNDER 8 MINUTES	8 - 10 MINUTES	10 - 15 MINUTES	15 - 20 MINUTES	20 - 25 MINUTES	25 - 30 MINUTES	30 - 35 MINUTES	35 - 40 MINUTES	40 - 45 MINUTES	45 - 50 MINUTES	OVER 50 MINUTES
H-W	25.00%	15.00%	25.00%	17.00%	12.00%	15.00%	10.00%	1.00%	1.00%	2.00%	1.00%	1.00%
H-S	37.50%	45.00%	20.00%	13.00%	5.00%	10.00%	2.00%	1.00%	1.00%	1.00%	1.00%	1.00%
H-O	37.50%	20.00%	18.00%	25.00%	10.00%	15.00%	5.00%	1.00%	1.00%	3.00%	1.00%	1.00%
SUM/MEAN	100.00%	28.13%	20.50%	18.50%	8.63%	13.13%	5.13%	1.00%	1.00%	2.00%	1.00%	1.00%

CUMULATIVE TRIP OPERATING MODES (FOR TOTAL EMISSIONS ANALYSES):

TRIP TYPE	MEAN TRAVEL TIME (MINUTES)	MEAN COLD START MODE	MEAN HOT START MODE	MEAN HOT STABLE MODE	NONCAT COLD START MODE	NONCAT HOT START MODE	CATALYST COLD START MODE	CATALYST HOT START MODE
H-W	16.10	60.64%	5.17%	34.19%	52.68%	13.14%	60.96%	4.85%
H-S	11.83	41.95%	38.51%	19.53%	27.04%	53.42%	42.56%	37.91%
H-O	15.45	45.36%	21.96%	32.68%	29.20%	38.12%	46.02%	21.31%
MEANS	14.25	47.90%	23.97%	28.13%	34.26%	37.61%	48.46%	23.42%

TABLE D-32. VEHICLE TRAVEL TIME PATTERNS AND OPERATING MODES, OFF-BASE HOUSING AT NAF EL CENTRO

TRIP TYPE	PORTION OF TOTAL TRIPS	DISTRIBUTION OF TRAVEL BY TRIP DURATION INTERVALS										
		UNDER 8 MINUTES	8 - 10 MINUTES	10 - 15 MINUTES	15 - 20 MINUTES	20 - 25 MINUTES	25 - 30 MINUTES	30 - 35 MINUTES	35 - 40 MINUTES	40 - 45 MINUTES	45 - 50 MINUTES	OVER 50 MINUTES
H-W	25.00%	20.00%	25.00%	20.00%	10.00%	10.00%	2.00%	2.00%	4.00%	3.00%	2.00%	2.00%
H-S	37.50%	40.00%	20.00%	15.00%	10.00%	5.00%	2.00%	1.00%	2.00%	2.00%	2.00%	1.00%
H-O	37.50%	20.00%	15.00%	25.00%	10.00%	10.00%	3.00%	5.00%	5.00%	3.00%	2.00%	2.00%
SUM/MEAN	100.00%	27.50%	19.38%	20.00%	10.00%	8.13%	2.38%	2.75%	3.63%	2.63%	2.00%	1.63%

CUMULATIVE TRIP OPERATING MODES (FOR TOTAL EMISSIONS ANALYSES):

TRIP TYPE	MEAN TRAVEL TIME (MINUTES)	MEAN COLD START MODE	MEAN HOT START MODE	MEAN HOT STABLE MODE	NONCAT COLD START MODE	NONCAT HOT START MODE	CATALYST COLD START MODE	CATALYST HOT START MODE
H-W	16.08	63.56%	5.42%	31.01%	55.22%	13.77%	63.90%	5.08%
H-S	12.83	40.65%	37.31%	22.04%	26.20%	51.76%	41.23%	36.73%
H-O	17.43	43.29%	20.96%	35.75%	27.87%	36.38%	43.91%	20.33%
MEANS	15.36	47.37%	23.21%	29.43%	34.08%	36.49%	47.90%	22.67%

TABLE D-33. EMFAC7F INPUT ASSUMPTIONS, NAWS PT MUGU OFF-BASE HOUSING

SUMMARY OF INPUT ASSUMPTIONS:

CALENDAR YEAR: 1999 I&M PROGRAM: YES

VEHICLE MIX ASSUMPTIONS:

LDA	LDT	MDT	HDG	HDD	BUS	MCY
70.94%	25.50%	2.52%	0.00%	0.00%	0.00%	1.04%

AIR TEMPERATURE FOR EXHAUST RATES, SUMMER: 60 WINTER: 50

EVAPORATIVE EMISSIONS TEMPERATURE PATTERNS:

	MINIMUM	8 AM	9 AM	11 AM	1 PM	MAXIMUM
SUMMER	55	57	59	65	68	70
WINTER	45	45	47	54	60	62

OPERATING MODE ASSUMPTIONS BY TRIP TYPE:

	COLD START	HOT START	HOT STABLE	3-CATEGORY MIX BASIS: WORK	SHOP	OTHER
H-W	54.52%	4.65%	40.83%	100.0%	0.0%	0.0%
H-S	42.23%	38.77%	19.00%	0.0%	100.0%	0.0%
H-O	44.46%	21.53%	34.01%	0.0%	0.0%	100.0%
O-W	39.94%	24.70%	35.36%	0.0%	0.0%	0.0%
O-O	22.55%	57.72%	19.73%	0.0%	0.0%	0.0%
WORK	54.52%	4.65%	40.83%			
SHOP	42.23%	38.77%	19.00%			
OTHER	44.46%	21.53%	34.01%			

NOTES:
LDA = light duty autos
LDT = light duty trucks
MDT = medium duty trucks
HDG = heavy duty gasoline-fueled vehicles
HDD = heavy duty diesel-fueled vehicles
BUS = diesel-fueled urban buses
MCY = motorcycles
H-W = home-work trips
H-S = home-shopping trips
H-O = home-other trips
O-W = other-work trips
O-O = other-other trips
WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)

TABLE D-34. 1999 EMISSION RATES, NAWS PT MUGU OFF-BASE HOUSING

POL-LUTANT	TRIP PURPOSE	GRAM/MILE RATES BY SPEED IN MPH 15	25	35	45	55
ROG	WORK	1.67	1.36	1.25	1.17	1.18
	SHOP	1.54	1.23	1.12	1.04	1.05
	OTHER	1.54	1.23	1.12	1.04	1.05
NOx	WORK	1.18	0.99	0.98	1.12	1.43
	SHOP	1.24	1.05	1.04	1.18	1.49
	OTHER	1.18	0.99	0.98	1.12	1.43
CO-S	WORK	16.68	14.57	13.62	13.18	13.71
	SHOP	15.28	13.17	12.22	11.78	12.30
	OTHER	15.22	13.11	12.16	11.72	12.24
CO-W	WORK	20.25	17.87	16.80	16.30	16.85
	SHOP	17.54	15.16	14.08	13.58	14.14
	OTHER	17.93	15.55	14.47	13.97	14.53
PMEX	WORK	0.01	0.01	0.01	0.01	0.01
	SHOP	0.01	0.01	0.01	0.01	0.01
	OTHER	0.01	0.01	0.01	0.01	0.01
PMTW	WORK	0.20	0.20	0.20	0.20	0.20
	SHOP	0.20	0.20	0.20	0.20	0.20
	OTHER	0.20	0.20	0.20	0.20	0.20

	SOAK	DRNL/RSTL	ROAD DUST
WORK	0.50	3.54	2.90
SHOP	0.50	3.54	2.90
OTHER	0.50	3.54	2.90

NOTES: WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)
ROG = reactive organic gases (summer fuel volatility)
NOx = oxides of nitrogen (summer fuel volatility)
CO-S = carbon monoxide (summer fuel volatility)
CO-W = carbon monoxide (winter fuel volatility)
PMEX = exhaust particulate matter
PMTW = tire wear particulate matter
DRNL = diurnal evaporative emissions (grams/veh-day)
RSTL = resting loss evaporative emissions (g/veh-day)
SOAK = hot soak emission rate in grams/trip
ROAD DUST = resuspended road dust (PM10 grams/vmt)

TABLE D-35. EMFAC7F INPUT ASSUMPTIONS, NAS LEMOORE OFF-BASE HOUSING

SUMMARY OF INPUT ASSUMPTIONS:

CALENDAR YEAR: 1999 I&M PROGRAM: YES

VEHICLE MIX ASSUMPTIONS:

LDA	LDT	MDT	HDG	HDD	BUS	MCY
70.94%	25.50%	2.52%	0.00%	0.00%	0.00%	1.04%

AIR TEMPERATURE FOR EXHAUST RATES, SUMMER: 85 WINTER: 40

EVAPORATIVE EMISSIONS TEMPERATURE PATTERNS:

	MINIMUM	8 AM	9 AM	11 AM	1 PM	MAXIMUM
SUMMER	60	64	70	86	94	100
WINTER	35	35	37	43	49	50

OPERATING MODE ASSUMPTIONS BY TRIP TYPE:

	COLD START	HOT START	HOT STABLE	3-CATEGORY MIX BASIS: WORK	SHOP	OTHER
H-W	60.64%	5.17%	34.19%	100.0%	0.0%	0.0%
H-S	41.95%	38.51%	19.54%	0.0%	100.0%	0.0%
H-O	45.36%	21.96%	32.68%	0.0%	0.0%	100.0%
O-W	39.94%	24.70%	35.36%	0.0%	0.0%	0.0%
O-O	22.55%	57.72%	19.73%	0.0%	0.0%	0.0%
WORK	60.64%	5.17%	34.19%			
SHOP	41.95%	38.51%	19.54%			
OTHER	45.36%	21.96%	32.68%			

NOTES:
LDA = light duty autos
LDT = light duty trucks
MDT = medium duty trucks
HDG = heavy duty gasoline-fueled vehicles
HDD = heavy duty diesel-fueled vehicles
BUS = diesel-fueled urban buses
MCY = motorcycles
H-W = home-work trips
H-S = home-shopping trips
H-O = home-other trips
O-W = other-work trips
O-O = other-other trips
WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)

TABLE D-36. 1999 EMISSION RATES, NAS LEMOORE OFF-BASE HOUSING

POL-LUTANT	TRIP PURPOSE	GRAM/MILE RATES BY SPEED IN MPH 15	25	35	45	55
ROG	WORK	1.67	1.10	0.93	0.84	0.87
	SHOP	1.57	1.00	0.83	0.74	0.77
	OTHER	1.57	1.00	0.83	0.74	0.77
NOx	WORK	1.08	0.91	0.91	1.03	1.31
	SHOP	1.08	0.91	0.90	1.03	1.31
	OTHER	1.04	0.87	0.87	0.99	1.27
CO-S	WORK	12.41	10.22	9.23	8.78	9.31
	SHOP	11.52	9.33	8.35	7.89	8.43
	OTHER	11.38	9.19	8.21	7.75	8.29
CO-W	WORK	25.68	23.06	21.88	21.33	21.95
	SHOP	20.38	17.77	16.59	16.04	16.66
	OTHER	21.25	18.64	17.46	16.91	17.53
PMEX	WORK	0.01	0.01	0.01	0.01	0.01
	SHOP	0.01	0.01	0.01	0.01	0.01
	OTHER	0.01	0.01	0.01	0.01	0.01
PMTW	WORK	0.20	0.20	0.20	0.20	0.20
	SHOP	0.20	0.20	0.20	0.20	0.20
	OTHER	0.20	0.20	0.20	0.20	0.20

	SOAK	DRNL/RSTL	ROAD DUST
WORK	0.50	6.43	2.90
SHOP	0.50	6.43	2.90
OTHER	0.50	6.43	2.90

NOTES:
WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)
ROG = reactive organic gases (summer fuel volatility)
NOx = oxides of nitrogen (summer fuel volatility)
CO-S = carbon monoxide (summer fuel volatility)
CO-W = carbon monoxide (winter fuel volatility)
PMEX = exhaust particulate matter
PMTW = tire wear particulate matter
DRNL = diurnal evaporative emissions (grams/veh-day)
RSTL = resting loss evaporative emissions (g/veh-day)
SOAK = hot soak emission rate in grams/trip
ROAD DUST = resuspended road dust (PM10 grams/vmt)

TABLE D-37. EMFAC7F INPUT ASSUMPTIONS, NAF EL CENTRO OFF-BASE HOUSING

SUMMARY OF INPUT ASSUMPTIONS:

CALENDAR YEAR: 1999 I&M PROGRAM: YES

VEHICLE MIX ASSUMPTIONS:

LDA	LDT	MDT	HDG	HDD	BUS	MCY
70.94%	25.50%	2.52%	0.00%	0.00%	0.00%	1.04%

AIR TEMPERATURE FOR EXHAUST RATES, SUMMER: 90 WINTER: 60

EVAPORATIVE EMISSIONS TEMPERATURE PATTERNS:

	MINIMUM	8 AM	9 AM	11 AM	1 PM	MAXIMUM
SUMMER	78	81	85	96	101	105
WINTER	45	45	48	59	68	70

OPERATING MODE ASSUMPTIONS BY TRIP TYPE:

	COLD START	HOT START	HOT STABLE	3-CATEGORY MIX BASIS: WORK	SHOP	OTHER
H-W	63.56%	5.42%	31.02%	100.0%	0.0%	0.0%
H-S	40.65%	37.31%	22.04%	0.0%	100.0%	0.0%
H-O	43.29%	20.96%	35.75%	0.0%	0.0%	100.0%
O-W	39.94%	24.70%	35.36%	0.0%	0.0%	0.0%
O-O	22.55%	57.72%	19.73%	0.0%	0.0%	0.0%
WORK	63.56%	5.42%	31.02%			
SHOP	40.65%	37.31%	22.04%			
OTHER	43.29%	20.96%	35.75%			

NOTES: LDA = light duty autos
LDT = light duty trucks
MDT = medium duty trucks
HDG = heavy duty gasoline-fueled vehicles
HDD = heavy duty diesel-fueled vehicles
BUS = diesel-fueled urban buses
MCY = motorcycles
H-W = home-work trips
H-S = home-shopping trips
H-O = home-other trips
O-W = other-work trips
O-O = other-other trips
WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)

TABLE D-38. 1999 EMISSION RATES, NAF EL CENTRO OFF-BASE HOUSING

POL-LUTANT	TRIP PURPOSE	GRAM/MILE RATES BY SPEED IN MPH 15	25	35	45	55
ROG	WORK	1.81	1.15	0.96	0.87	0.90
	SHOP	1.68	1.02	0.84	0.74	0.78
	OTHER	1.67	1.01	0.83	0.73	0.77
NOx	WORK	1.11	0.93	0.93	1.05	1.34
	SHOP	1.07	0.90	0.89	1.02	1.30
	OTHER	1.03	0.86	0.85	0.97	1.26
CO-S	WORK	13.04	10.72	9.67	9.18	9.75
	SHOP	11.84	9.51	8.47	7.98	8.55
	OTHER	11.57	9.24	8.20	7.71	8.28
CO-W	WORK	18.43	16.23	15.23	14.77	15.28
	SHOP	14.37	12.16	11.16	10.70	11.21
	OTHER	14.72	12.51	11.52	11.05	11.56
PMEX	WORK	0.01	0.01	0.01	0.01	0.01
	SHOP	0.01	0.01	0.01	0.01	0.01
	OTHER	0.01	0.01	0.01	0.01	0.01
PMTW	WORK	0.20	0.20	0.20	0.20	0.20
	SHOP	0.20	0.20	0.20	0.20	0.20
	OTHER	0.20	0.20	0.20	0.20	0.20

	SOAK	DRNL/RSTL	ROAD DUST
WORK	0.50	8.11	2.90
SHOP	0.50	8.11	2.90
OTHER	0.50	8.11	2.90

NOTES: WORK = mix of H-W and O-W trips (see 3 category mix)
SHOP = home-shopping trips
OTHER = mix of H-O and O-O trips (see 3 category mix)
ROG = reactive organic gases (summer fuel volatility)
NOx = oxides of nitrogen (summer fuel volatility)
CO-S = carbon monoxide (summer fuel volatility)
CO-W = carbon monoxide (winter fuel volatility)
PMEX = exhaust particulate matter
PMTW = tire wear particulate matter
DRNL = diurnal evaporative emissions (grams/veh-day)
RSTL = resting loss evaporative emissions (g/veh-day)
SOAK = hot soak emission rate in grams/trip
ROAD DUST = resuspended road dust (PM10 grams/vmt)

Emissions Estimates for Personal Vehicles

TABLE D-39. TRIP GENERATION, TRIP PURPOSE DISSAGGREGATION, TRIP RATE ADJUSTMENTS, AND TRAVEL SPEED DISTRIBUTIONS FOR THE NAWS POINT MUGU ALTERNATIVE

Land Use And Trip Category	Trip Estimate Basis	Trip Purpose	Percent of Net Trips	Net Trip Rates	Deployment Plus TCM Reduction	Adjusted Net Trip Rate	Adjusted Net Trips	Overall Reduction Factor	Mean Trip Duration (Minutes)	Percent of Travel Time by Speed (mph) 15	25	35	45	55
On-Base BEQ/BOQ Housing	311 Personnel	WORK	30.9%	2.00	37.5%	1.25	389		7.68	30.0%	60.0%	10.0%	0.0%	0.0%
		SHOPPING	35.0%	2.26	37.5%	1.42	440		10.78	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	34.1%	2.21	37.5%	1.38	429		15.66	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Crews, Work Trips	372 Personnel	WORK	100.0%	2.00	53.0%	0.94	350		17.93	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	0.0%	0.00	0.0%	0.00	0		11.58	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	0.0%	0.00	0.0%	0.00	0		15.65	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Admin, Work Trips	313 Personnel	WORK	100.0%	2.00	24.8%	1.50	471		17.93	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	0.0%	0.00	0.0%	0.00	0		11.58	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	0.0%	0.00	0.0%	0.00	0		15.65	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Crews, Other Trips	372 Personnel	WORK	11.5%	0.87	0.00%	0.87	323		17.93	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	44.3%	3.34	0.00%	3.34	1,243		11.58	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	44.3%	3.34	0.00%	3.34	1,243		15.65	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Admin, Other Trips	313 Personnel	WORK	11.5%	0.87	0.00%	0.9	272		17.93	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	44.3%	3.34	0.00%	3.3	1,046		11.58	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	44.3%	3.34	0.00%	3.3	1,046		15.65	10.0%	25.0%	35.0%	15.0%	15.0%
TOTALS							7,252	15.2%						

TABLE D-39. TRIP GENERATION, TRIP PURPOSE DISSAGGREGATION, TRIP RATE ADJUSTMENTS, AND TRAVEL SPEED DISTRIBUTIONS FOR THE NAWS POINT MUGU ALTERNATIVE

Notes: TCM = transportation control measures (ridesharing, transit use, nonvehicular travel, etc.)

Vehicle trips represent a one-way travel event.

Institute of Transportation Engineers (1991) trip generation rate for apartments (6.47 trips/day) used for on-base housing; ITE trip rate for single family dwellings (9.55 trips/day) used for off-base housing.

Trip rates for off-base housing are split into base-related work trips (2 trips/day) and other household trips (7.55 trips/day) to facilitate subsequent adjustments for squadron deployments and transportation control measure effects.

As an annual average, 1.5 out of 4 E-2 squadrons (37.5%) will be deployed at any one time, but deployments will not affect administrative personnel.

All BEQ/BOQ trips are affected by squadron deployment rotations.

Base-related work trips from off-base housing for squadron crews will be affected by squadron deployment rotations, but other household trips (including other household work trips) will not be affected.

Trips from off-base housing for administrative and other non-deployed personnel will not be affected by squadron deployment rotations.

A vehicle occupancy factor of 1.33 (i.e., a 24.8% factor) is applied to base-related work trips from off-base housing (2 trips per day), but not to other household work trips (0.87 trips per day).

The combined effect of squadron deployment adjustments and vehicle occupancy adjustments is a 53% reduction (1 - (62.5% * 75.2%)).

Mean trip durations were derived from estimated travel time frequency distributions by trip type, recognizing land use patterns, roadway network configurations, and distances between communities in the region surrounding NAWS Point Mugu.

Vehicle speed distributions were estimated from general road network features.

TABLE D-40. VEHICLE EMISSIONS FOR E-2 PERSONNEL: NAWS POINT MUGU ALTERNATIVE

LAND USE	TRIP ESTIMATE BASIS	TRIP PURPOSE	AVERAGE DAILY TRIPS	MEAN TRIP DURATION (MINUTES)	AVERAGE DISTANCE (MILES)	DAILY VMT BY TRIP PURPOSE	AVERAGE TRAVEL SPEED (MPH)	ROG Emissions (lbs/day)	NOx Emissions (lbs/day)	PM10 Emissions (lbs/day)	Summer CO Emissions (lbs/day)	Winter CO Emissions (lbs/day)	SOx Emissions (lbs/day)
On-Base BEQ/BOQ Housing	311 Personnel	WORK	389	7.7	2.94	1,145	23.0	6.0	3.2	7.9	52.3	64.6	0.1
		SHOPPING	440	10.8	5.84	2,569	32.5	7.9	6.6	17.6	73.3	84.4	0.2
		OTHER	429	15.7	9.13	3,916	35.0	10.9	9.7	26.9	107.0	127.2	0.3
Off-Base Crews, Work Trips	372 Personnel	WORK	350	17.9	11.21	3,922	37.5	13.9	9.9	26.9	119.0	146.5	0.3
		SHOPPING	0	11.6	6.27	0	32.5	0.0	0.0	0.0	0.0	0.0	0.0
		OTHER	0	15.7	9.13	0	35.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Base Admin, Work Trips	313 Personnel	WORK	471	17.9	11.21	5,278	37.5	17.3	13.4	36.2	160.1	197.1	0.3
		SHOPPING	0	11.6	6.27	0	32.5	0.0	0.0	0.0	0.0	0.0	0.0
		OTHER	0	15.7	9.13	0	35.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Base Crews, Other Trips	372 Personnel	WORK	323	17.9	11.21	3,620	37.5	10.5	9.2	24.8	109.8	135.2	0.2
		SHOPPING	1,243	11.6	6.27	7,797	32.5	22.5	19.7	53.5	216.0	248.7	0.5
		OTHER	1,243	15.7	9.13	11,348	35.0	30.8	28.1	77.8	310.1	368.6	0.8
Off-Base Admin, Other Trips	313 Personnel	WORK	272	17.9	11.21	3,048	37.5	8.9	7.7	20.9	92.5	113.8	0.2
		SHOPPING	1,046	11.6	6.27	6,561	32.5	18.9	16.6	45.0	181.8	209.3	0.4
		OTHER	1,046	15.7	9.13	9,549	35.0	25.9	23.6	65.5	261.0	310.1	0.6

TABLE D-40. VEHICLE EMISSIONS FOR E-2 PERSONNEL: NAWS POINT MUGU ALTERNATIVE

LAND USE	TRIP ESTIMATE BASIS	TRIP PURPOSE	AVERAGE DAILY TRIPS	MEAN TRIP DURATION (MINUTES)	AVERAGE DISTANCE (MILES)	DAILY VMT BY TRIP PURPOSE	AVERAGE TRAVEL SPEED (MPH)	ROG Emissions (lbs/day)	NOx Emissions (lbs/day)	PM10 Emissions (lbs/day)	Summer CO Emissions (lbs/day)	Winter CO Emissions (lbs/day)	SOx Emissions (lbs/day)
TOTALS:		WORK	1,805	15.7	9.43	17,013	35.9	56.6	43.4	116.7	533.7	657.3	1.1
		SHOPPING	2,729	11.5	6.20	16,927	32.5	49.3	42.9	116.1	471.1	542.4	1.1
		OTHER	2,718	15.7	9.13	24,813	35.0	67.7	61.4	170.2	678.2	805.9	1.6
			......	......	......	......	.....	......	.....	.....	....	....	.....
			7,252	14.1	8.10	58,753	34.5	173.5	147.7	402.9	1,682.9	2,005.6	3.9

	AVERAGE DAILY TRIPS	DAILY VMT BY TRIP PURPOSE	DAYS/YEAR	ROG Emissions (tons/yr)	NOx Emissions (tons/yr)	CO Emissions (tons/yr)	SOx Emissions (tons/yr)	PM10 Emissions (tons/yr)
Base-Related Work Travel	1,210	10,346	240	4.46	3.18	44.38	0.08	8.51
Other Household Travel	6,042	48,408	365	23.67	21.05	254.98	0.56	57.73
	....	....		....	....	....	....	....
Totals	7,252	58,753		28.12	24.24	299.36	0.64	66.24

Notes: VMT = vehicle miles traveled
ROG = reactive organic compounds
NOx = nitrogen oxides
CO = carbon monoxide
SOx = sulfur oxides
PM10 = inhalable particulate matter (includes resuspended road dust)
See Table D-39 for trip generation rates.
Sulfur oxide emissions estimated as 0.03 grams per vmt (Bay Area Air Quality Management District 1996).
Base-related and other household work trips occur 240 days per year.
Other household travel includes work trips that are not base-related (i.e., a spouse's work trips) plus all shopping and other trips.
Remaining other household trips (shopping and other trip categories) occur 365 days per year.

TABLE D-41. TRIP GENERATION, TRIP PURPOSE DISSAGGREGATION, TRIP RATE ADJUSTMENTS, AND TRAVEL SPEED DISTRIBUTIONS FOR THE NAS LEMOORE ALTERNATIVE

Land Use And Trip Category	Trip Estimate Basis	Trip Purpose	Percent of Net Trips	Net Trip Rates	Deployment Plus TCM Reduction	Adjusted Net Trip Rate	Adjusted Net Trips	Overall Reduction Factor	Mean Trip Duration (Minutes)	Percent of Travel Time by Speed (mph)				
										15	25	35	45	55
On-Base BEQ/BOQ Housing	311 Personnel	WORK	30.9%	2.00	37.5%	1.25	389		7.68	15.0%	25.0%	35.0%	20.0%	5.0%
		SHOPPING	35.0%	2.26	37.5%	1.42	440		10.78	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	34.1%	2.21	37.5%	1.38	429		15.65	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Crews, Work Trips	372 Personnel	WORK	100.0%	2.00	53.0%	0.94	350		16.10	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	0.0%	0.00	0.0%	0.00	0		11.83	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	0.0%	0.00	0.0%	0.00	0		15.45	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Admin, Work Trips	305 Personnel	WORK	100.0%	2.00	24.8%	1.50	459		16.10	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	0.0%	0.00	0.0%	0.00	0		11.83	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	0.0%	0.00	0.0%	0.00	0		15.46	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Crews, Other Trips	372 Personnel	WORK	11.5%	0.87	0.00%	0.87	323		16.10	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	44.3%	3.34	0.00%	3.34	1,243		11.83	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	44.3%	3.34	0.00%	3.34	1,243		15.45	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Admin, Other Trips	305 Personnel	WORK	11.6%	0.87	0.00%	0.87	266		16.10	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	44.3%	3.34	0.00%	3.34	1,019		11.83	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	44.3%	3.34	0.00%	3.34	1,019		15.45	10.0%	25.0%	35.0%	15.0%	15.0%
							......	......						
TOTALS							7,179	15.3%						

TABLE D-41. TRIP GENERATION, TRIP PURPOSE DISSAGGREGATION, TRIP RATE ADJUSTMENTS, AND TRAVEL SPEED DISTRIBUTIONS FOR THE NAS LEMOORE ALTERNATIVE

Notes: TCM = transportation control measures (ridesharing, transit use, nonvehicular travel, etc.)

Vehicle trips represent a one-way travel event.

Institute of Transportation Engineers (1991) trip generation rate for apartments (6.47 trips/day) used for on-base housing; ITE trip rate for single family dwellings (9.55 trips/day) used for off-base housing.

Trip rates for off-base housing are split into base-related work trips (2 trips/day) and other household trips (7.55 trips/day) to facilitate subsequent adjustments for squadron deployments and transportation control measure effects.

As an annual average, 1.5 out of 4 E-2 squadrons (37.5%) will be deployed at any one time, but deployments will not affect administrative personnel.

All BEQ/BOQ trips are affected by squadron deployment rotations.

Base-related work trips from off-base housing for squadron crews will be affected by squadron deployment rotations, but other household trips (including other household work trips) will not be affected.

Trips from off-base housing for administrative and other non-deployed personnel will not be affected by squadron deployment rotations.

A vehicle occupancy factor of 1.33 (i.e., a 24.8% factor) is applied to base-related work trips from off-base housing (2 trips per day), but not to other household work trips (0.87 trips per day).

The combined effect of squadron deployment adjustments and vehicle occupancy adjustments is a 53% reduction (1 - (62.5% * 75.2%)).

Mean trip durations were derived from estimated travel time frequency distributions by trip type, recognizing land use patterns, roadway network configurations, and distances between communities in the region surrounding NAS Lemoore.

Vehicle speed distributions were estimated from general road network features.

TABLE D-42. VEHICLE EMISSIONS FOR E-2 PERSONNEL: NAS LEMOORE ALTERNATIVE

LAND USE	TRIP ESTIMATE BASIS	TRIP PURPOSE	AVERAGE DAILY TRIPS	MEAN TRIP DURATION (MINUTES)	AVERAGE DISTANCE (MILES)	DAILY VMT BY TRIP PURPOSE	AVERAGE TRAVEL SPEED (MPH)	ROG Emissions (lbs/day)	NOx Emissions (lbs/day)	PM10 Emissions (lbs/day)	Summer CO Emissions (lbs/day)	Winter CO Emissions (lbs/day)	SOx Emissions (lbs/day)
On-Base BEQ/BOQ Housing	311 Personnel	WORK	389	7.7	4.16	1,618	32.5	6.0	4.1	11.1	42.7	105.0	0.1
		SHOPPING	440	10.8	5.84	2,569	32.5	7.0	5.8	17.6	50.7	99.8	0.2
		OTHER	429	15.7	9.13	3,916	35.0	9.1	8.5	26.9	72.1	150.8	0.3
Off-Base Crews, Work Trips	372 Personnel	WORK	350	16.1	10.06	3,522	37.5	12.7	8.2	24.2	72.8	171.2	0.2
		SHOPPING	0	11.8	6.41	0	32.5	0.0	0.0	0.0	0.0	0.0	0.0
		OTHER	0	15.5	9.01	0	35.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Base Admin, Work Trips	305 Personnel	WORK	459	16.1	10.06	4,619	37.5	14.2	10.8	31.7	95.5	224.5	0.3
		SHOPPING	0	11.8	6.41	0	32.5	0.0	0.0	0.0	0.0	0.0	0.0
		OTHER	0	15.5	9.01	0	35.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Base Crews, Other Trips	372 Personnel	WORK	323	16.1	10.06	3,250	37.5	7.6	7.6	22.3	67.2	158.0	0.2
		SHOPPING	1,243	11.8	6.41	7,965	32.5	19.5	17.5	54.6	153.0	298.8	0.5
		OTHER	1,243	15.5	9.01	11,203	35.0	25.0	24.6	76.8	208.7	438.2	0.7
Off-Base Admin, Other Trips	305 Personnel	WORK	265	16.1	10.06	2,667	37.5	6.3	6.2	18.3	55.1	129.6	0.2
		SHOPPING	1,019	11.8	6.41	6,530	32.5	16.0	14.4	44.8	125.4	244.9	0.4
		OTHER	1,019	15.5	9.01	9,184	35.0	20.5	20.1	63.0	171.1	359.2	0.6

TABLE D-42. VEHICLE EMISSIONS FOR E-2 PERSONNEL: NAS LEMOORE ALTERNATIVE

LAND USE	TRIP ESTIMATE BASIS	TRIP PURPOSE	AVERAGE DAILY TRIPS	MEAN TRIP DURATION (MINUTES)	AVERAGE DISTANCE (MILES)	DAILY VMT BY TRIP PURPOSE	AVERAGE TRAVEL SPEED (MPH)	ROG Emissions (lbs/day)	NOx Emissions (lbs/day)	PM10 Emissions (lbs/day)	Summer CO Emissions (lbs/day)	Winter CO Emissions (lbs/day)	SOx Emissions (lbs/day)
	TOTALS:	WORK	1,786	14.3	8.78	15,676	36.9	46.8	36.9	107.5	333.2	788.2	1.0
		SHOPPING	2,702	11.7	6.32	17,064	32.5	42.5	37.7	117.0	329.1	643.5	1.1
		OTHER	2,691	15.5	9.03	24,303	35.0	54.6	53.2	166.7	451.9	948.3	1.6
			7,179	13.7	7.95	57,042	34.7	143.9	127.8	391.2	1,114.1	2,380.0	3.8

	AVERAGE DAILY TRIPS	DAILY VMT BY TRIP PURPOSE	DAYS/YEAR	ROG Emissions (tons/yr)	NOx Emissions (tons/yr)	CO Emissions (tons/yr)	SOx Emissions (tons/yr)	PM10 Emissions (tons/yr)
Base-Related Work Travel	1,198	9,759	240	3.95	2.77	42.69	0.08	8.03
Other Household Travel	5,981	47,283	365	19.39	18.25	241.10	0.55	56.64
Totals	7,179	57,042		23.34	21.02	283.79	0.62	64.67

Notes: VMT = vehicle miles traveled
ROG = reactive organic compounds
NOx = nitrogen oxides
CO = carbon monoxide
SOx = sulfur oxides
PM10 = inhalable particulate matter (includes resuspended road dust)
See Table D-41 for trip generation rates.
Sulfur oxide emissions estimated as 0.03 grams per vmt (Bay Area Air Quality Management District 1996).
Base-related and other household work trips occur 240 days per year.
Other household travel includes work trips that are not base-related (i.e., a spouse's work trips) plus all shopping and other trips.
Remaining other household trips (shopping and other trip categories) occur 365 days per year.

TABLE D-43. TRIP GENERATION, TRIP PURPOSE DISSAGGREGATION, TRIP RATE ADJUSTMENTS, AND TRAVEL SPEED DISTRIBUTIONS FOR THE NAF EL CENTRO ALTERNATIVE

Land Use And Trip Category	Trip Estimate Basis	Trip Purpose	Percent of Net Trips	Net Trip Rates	Deployment Plus TCM Reduction	Adjusted Net Trip Rate	Adjusted Net Trips	Overall Reduction Factor	Mean Trip Duration (Minutes)	Percent of Travel Time by Speed (mph) 15	25	35	45	55
On-Base BEQ/BOQ Housing	311 Personnel	WORK	30.9%	2.00	37.5%	1.25	389		7.68	80.0%	20.0%	0.0%	0.0%	0.0%
		SHOPPING	35.0%	2.26	37.5%	1.42	440		10.78	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	34.1%	2.21	37.5%	1.38	429		15.65	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Crews, Work Trips	372 Personnel	WORK	100.0%	2.00	53.0%	0.94	350		16.08	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	0.0%	0.00	0.0%	0.00	0		12.83	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	0.0%	0.00	0.0%	0.00	0		17.43	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Admin, Work Trips	370 Personnel	WORK	100.0%	2.00	24.8%	1.50	556		16.08	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	0.0%	0.00	0.0%	0.00	0		12.83	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	0.0%	0.00	0.0%	0.00	0		17.43	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Crews, Other Trips	372 Personnel	WORK	11.5%	0.87	0.00%	0.87	323		16.08	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	44.3%	3.34	0.00%	3.34	1,243		12.83	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	44.3%	3.34	0.00%	3.34	1,243		17.43	10.0%	25.0%	35.0%	15.0%	15.0%
Off-Base Admin, Other Trips	370 Personnel	WORK	11.5%	0.87	0.00%	0.87	321		16.08	5.0%	25.0%	30.0%	20.0%	20.0%
		SHOPPING	44.3%	3.34	0.00%	3.34	1,236		12.83	10.0%	35.0%	35.0%	10.0%	10.0%
		OTHER	44.3%	3.34	0.00%	3.34	1,236		17.43	10.0%	25.0%	35.0%	15.0%	15.0%
TOTALS							7,756	14.6%						

TABLE D-43. TRIP GENERATION, TRIP PURPOSE DISSAGGREGATION, TRIP RATE ADJUSTMENTS, AND TRAVEL SPEED DISTRIBUTIONS FOR THE NAF EL CENTRO ALTERNATIVE

Notes: TCM = transportation control measures (ridesharing, transit use, nonvehicular travel, etc.)

Vehicle trips represent a one-way travel event.

Institute of Transportation Engineers (1991) trip generation rate for apartments (6.47 trips/day) used for on-base housing; ITE trip rate for single family dwellings (9.55 trips/day) used for off-base housing.

Trip rates for off-base housing are split into base-related work trips (2 trips/day) and other household trips (7.55 trips/day) to facilitate subsequent adjustments for squadron deployments and transportation control measure effects.

As an annual average, 1.5 out of 4 E-2 squadrons (37.5%) will be deployed at any one time, but deployments will not affect administrative personnel.

All BEQ/BOQ trips are affected by squadron deployment rotations.

Base-related work trips from off-base housing for squadron crews will be affected by squadron deployment rotations, but other household trips (including other household work trips) will not be affected.

Trips from off-base housing for administrative and other non-deployed personnel will not be affected by squadron deployment rotations.

A vehicle occupancy factor of 1.33 (i.e., a 24.8% factor) is applied to base-related work trips from off-base housing (2 trips per day), but not to other household work trips (0.87 trips per day).

The combined effect of squadron deployment adjustments and vehicle occupancy adjustments is a 53% reduction (1 - (62.5% * 75.2%)).

Mean trip durations were derived from estimated travel time frequency distributions by trip type, recognizing land use patterns, roadway network configurations, and distances between communities in the region surrounding NAF El Centro.

Vehicle speed distributions were estimated from general road network features.

TABLE D-44. VEHICLE EMISSIONS FOR E-2 PERSONNEL: NAF EL CENTRO ALTERNATIVE

LAND USE	TRIP ESTIMATE BASIS	TRIP PURPOSE	AVERAGE DAILY TRIPS	MEAN TRIP DURATION (MINUTES)	AVERAGE DISTANCE (MILES)	DAILY VMT BY TRIP PURPOSE	AVERAGE TRAVEL SPEED (MPH)	ROG Emissions (lbs/day)	NOx Emissions (lbs/day)	PM10 Emissions (lbs/day)	Summer CO Emissions (lbs/day)	Winter CO Emissions (lbs/day)	SOx Emissions (lbs/day)
On-Base BEQ/BOQ Housing	311 Personnel	WORK	389	7.7	2.18	846	17.0	5.5	2.2	5.8	27.0	40.7	0.1
		SHOPPING	440	10.8	5.84	2,569	32.5	7.6	5.8	17.6	52.5	68.9	0.2
		OTHER	429	15.7	9.13	3,916	35.0	9.6	8.6	26.9	74.1	103.4	0.3
Off-Base Crews, Work Trips	372 Personnel	WORK	350	16.1	10.05	3,517	37.5	14.3	8.4	24.1	76.1	119.1	0.2
		SHOPPING	0	12.8	6.95	0	32.5	0.0	0.0	0.0	0.0	0.0	0.0
		OTHER	0	17.4	10.17	0	35.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Base Admin, Work Trips	370 Personnel	WORK	556	16.1	10.05	5,588	37.5	18.9	13.3	38.3	121.0	189.2	0.4
		SHOPPING	0	12.8	6.95	0	32.5	0.0	0.0	0.0	0.0	0.0	0.0
		OTHER	0	17.4	10.17	0	35.0	0.0	0.0	0.0	0.0	0.0	0.0
Off-Base Crews, Other Trips	372 Personnel	WORK	323	16.1	10.05	3,246	37.5	8.0	7.7	22.3	70.3	109.9	0.2
		SHOPPING	1,243	12.8	6.95	8,638	32.5	21.7	18.9	59.2	168.6	219.4	0.6
		OTHER	1,243	17.4	10.17	12,638	35.0	28.4	27.3	86.7	235.5	327.5	0.8
Off-Base Admin, Other Trips	370 Personnel	WORK	321	16.1	10.05	3,226	37.5	8.0	7.7	22.1	69.8	109.3	0.2
		SHOPPING	1,236	12.8	6.95	8,590	32.5	21.6	18.8	58.9	167.6	218.2	0.6
		OTHER	1,236	17.4	10.17	12,567	35.0	28.2	27.2	86.2	234.2	325.6	0.8

TABLE D-44. VEHICLE EMISSIONS FOR E-2 PERSONNEL: NAF EL CENTRO ALTERNATIVE

LAND USE	TRIP ESTIMATE BASIS	TRIP PURPOSE	AVERAGE DAILY TRIPS	MEAN TRIP DURATION (MINUTES)	AVERAGE DISTANCE (MILES)	DAILY VMT BY TRIP PURPOSE	AVERAGE TRAVEL SPEED (MPH)	ROG Emissions (lbs/day)	NOx Emissions (lbs/day)	PM10 Emissions (lbs/day)	Summer CO Emissions (lbs/day)	Winter CO Emissions (lbs/day)	SOx Emissions (lbs/day)
TOTALS:		WORK	1,939	14.4	8.47	16,424	35.3	54.8	39.4	112.6	364.2	568.3	1.1
		SHOPPING	2,919	12.5	6.78	19,797	32.5	50.8	43.4	135.8	388.7	506.6	1.3
		OTHER	2,908	17.2	10.01	29,122	35.0	66.2	63.1	199.7	543.8	756.6	1.9
			7,766	14.7	8.41	65,343	34.3	171.8	145.8	448.1	1,296.7	1,831.4	4.3

	AVERAGE DAILY TRIPS	DAILY VMT BY TRIP PURPOSE	DAYS/YEAR	ROG Emissions (tons/yr)	NOx Emissions (tons/yr)	CO Emissions (tons/yr)	SOx Emissions (tons/yr)	PM10 Emissions (tons/yr)
Base-Related Work Travel	1,295	9,952	240	4.65	2.87	34.39	0.08	8.19
Other Household Travel	6,471	55,391	365	23.29	21.28	221.91	0.64	66.55
Totals	7,766	65,343		27.93	24.15	256.30	0.72	74.74

Notes: VMT = vehicle miles traveled
ROG = reactive organic compounds
NOx = nitrogen oxides
CO = carbon monoxide
SOx = sulfur oxides
PM10 = inhalable particulate matter (includes resuspended road dust)
See Table D-43 for trip generation rates.
Sulfur oxide emissions estimated as 0.03 grams per vmt (Bay Area Air Quality Management District 1996).
Base-related and other household work trips occur 240 days per year.
Other household travel includes work trips that are not base-related (i.e., a spouse's work trips) plus all shopping and other trips.
Remaining other household trips (shopping and other trip categories) occur 365 days per year.

Vehicles Use and Emission Estimates, Government Vehicles

TABLE D-45. VEHICLE TRAVEL TIME PATTERNS AND OPERATING MODES, GOVERNMENT VEHICLE USE

TRIP TYPE	PORTION OF TOTAL TRIPS	DISTRIBUTION OF TRAVEL BY TRIP DURATION INTERVALS: UNDER 8 MINUTES	8 - 10 MINUTES	10 - 15 MINUTES	15 - 20 MINUTES	20 - 25 MINUTES	25 - 30 MINUTES	30 - 35 MINUTES	35 - 40 MINUTES	40 - 45 MINUTES	45 - 50 MINUTES	OVER 50 MINUTES
OFF-BASE	10.00%	5.00%	10.00%	15.00%	20.00%	20.00%	10.00%	6.00%	5.00%	3.00%	2.00%	4.00%
ON-BASE	90.00%	60.00%	10.00%	10.00%	10.00%	5.00%	5.00%	0.00%	0.00%	0.00%	0.00%	0.00%
SUM/MEAN	100.00%	54.50%	10.00%	10.50%	11.00%	6.50%	5.50%	0.60%	0.50%	0.30%	0.20%	0.40%

CUMULATIVE TRIP OPERATING MODES (FOR TOTAL EMISSIONS ANALYSES):

TRIP TYPE	MEAN TRAVEL TIME (MINUTES)	MEAN COLD START MODE	MEAN HOT START MODE	MEAN HOT STABLE MODE	NONCAT COLD START MODE	NONCAT HOT START MODE	CATALYST COLD START MODE	CATALYST HOT START MODE
OFF-BASE	22.45	31.70%	17.30%	51.00%	22.55%	26.45%	31.80%	17.21%
ON-BASE	9.70	39.82%	44.64%	15.54%	22.07%	62.39%	40.00%	44.46%
MEANS	10.98	39.01%	41.91%	19.08%	22.12%	58.80%	39.18%	41.73%

TABLE D-46. EMFAC7F INPUT ASSUMPTIONS, NAWS PT MUGU GOVERNMENT VEHICLES

SUMMARY OF INPUT ASSUMPTIONS:

CALENDAR YEAR: 1999 I&M PROGRAM: YES

VEHICLE MIX ASSUMPTIONS:

LDA	LDT	MDT	HDG	HDD	BUS	MCY
5.00%	55.00%	29.50%	3.00%	6.50%	1.00%	0.00%

AIR TEMPERATURE FOR EXHAUST RATES, SUMMER: 60 WINTER: 50

EVAPORATIVE EMISSIONS TEMPERATURE PATTERNS:

	MINIMUM	8 AM	9 AM	11 AM	1 PM	MAXIMUM
SUMMER	55	57	59	65	68	70
WINTER	45	45	47	54	60	62

OPERATING MODE ASSUMPTIONS BY TRIP TYPE:

	COLD START	HOT START	HOT STABLE
OFF-BASE	31.70%	17.30%	51.00%
ON-BASE	39.82%	44.64%	15.54%

NOTES: LDA = light duty autos
LDT = light duty trucks
MDT = medium duty trucks
HDG = heavy duty gasoline-fueled vehicles
HDD = heavy duty diesel-fueled vehicles
BUS = diesel-fueled urban buses
MCY = motorcycles
OFF-BASE = trips coming onto or leaving the base
ON-BASE = trips remaining within base boundaries

TABLE D-47. 1999 EMISSION RATES, NAWS PT MUGU GOVERNMENT VEHICLES

POL-LUTANT	TRIP PURPOSE	GRAM/MILE RATES BY SPEED IN MPH 15	25	35	45	55
ROG	OFF-BASE	1.56	1.19	1.03	0.91	0.90
	ON-BASE	1.73	1.37	1.21	1.08	1.07
NOx	OFF-BASE	2.45	2.02	1.96	2.23	2.86
	ON-BASE	2.65	2.22	2.16	2.43	3.06
CO-S	OFF-BASE	12.16	9.29	8.01	7.44	8.08
	ON-BASE	13.74	10.87	9.59	9.02	9.66
CO-W	OFF-BASE	12.98	9.80	8.38	7.75	8.48
	ON-BASE	14.52	11.34	9.92	9.28	10.01
PMEX	OFF-BASE	0.14	0.14	0.14	0.14	0.14
	ON-BASE	0.14	0.14	0.14	0.14	0.14
PMTW	OFF-BASE	0.24	0.24	0.24	0.24	0.24
	ON-BASE	0.24	0.24	0.24	0.24	0.24

	SOAK	DRNL/RSTL	ROAD DUST
OFF-BASE	0.43	3.57	2.90
ON-BASE	0.43	3.57	2.90

NOTES: OFF-BASE = trips coming onto or leaving the base
ON-BASE = trips remaining within base boundaries
ROG = reactive organic gases (summer fuel volatility)
NOx = oxides of nitrogen (summer fuel volatility)
CO-S = carbon monoxide (summer fuel volatility)
CO-W = carbon monoxide (winter fuel volatility)
PMEX = exhaust particulate matter
PMTW = tire wear particulate matter
DRNL = diurnal evaporative emissions (grams/veh-day)
RSTL = resting loss evaporative emissions (g/veh-day)
SOAK = hot soak emission rate in grams/trip
ROAD DUST = resuspended road dust (PM10 grams/vmt)

TABLE D-48. EMFAC7F INPUT ASSUMPTIONS, NAS LEMOORE GOVERNMENT VEHICLES

SUMMARY OF INPUT ASSUMPTIONS:

CALENDAR YEAR: 1999 I&M PROGRAM: YES

VEHICLE MIX ASSUMPTIONS:

LDA	LDT	MDT	HDG	HDD	BUS	MCY
5.00%	55.00%	29.50%	3.00%	6.50%	1.00%	0.00%

AIR TEMPERATURE FOR EXHAUST RATES, SUMMER: 85 WINTER: 40

EVAPORATIVE EMISSIONS TEMPERATURE PATTERNS:

	MINIMUM	8 AM	9 AM	11 AM	1 PM	MAXIMUM
SUMMER	60	64	70	86	94	100
WINTER	35	35	37	43	49	50

OPERATING MODE ASSUMPTIONS BY TRIP TYPE:

	COLD START	HOT START	HOT STABLE
OFF-BASE	31.70%	17.30%	51.00%
ON-BASE	39.82%	44.64%	15.54%

NOTES: LDA = light duty autos
LDT = light duty trucks
MDT = medium duty trucks
HDG = heavy duty gasoline-fueled vehicles
HDD = heavy duty diesel-fueled vehicles
BUS = diesel-fueled urban buses
MCY = motorcycles
OFF-BASE = trips coming onto or leaving the base
ON-BASE = trips remaining within base boundaries

TABLE D-49. 1999 EMISSION RATES, NAS LEMOORE GOVERNMENT VEHICLES

POL-LUTANT	TRIP PURPOSE	GRAM/MILE RATES BY SPEED IN MPH 15	25	35	45	55
ROG	OFF-BASE	1.59	1.05	0.86	0.74	0.74
	ON-BASE	1.71	1.18	0.99	0.86	0.86
NOx	OFF-BASE	2.35	1.94	1.89	2.14	2.74
	ON-BASE	2.52	2.11	2.06	2.31	2.91
CO-S	OFF-BASE	12.32	9.43	8.15	7.59	8.22
	ON-BASE	14.06	11.18	9.90	9.34	9.97
CO-W	OFF-BASE	14.00	10.44	8.85	8.13	8.97
	ON-BASE	15.51	11.95	10.36	9.64	10.48
PMEX	OFF-BASE	0.14	0.14	0.14	0.14	0.14
	ON-BASE	0.14	0.14	0.14	0.14	0.14
PMTW	OFF-BASE	0.24	0.24	0.24	0.24	0.24
	ON-BASE	0.24	0.24	0.24	0.24	0.24

	SOAK	DRNL/RSTL	ROAD DUST
OFF-BASE	0.43	8.36	2.90
ON-BASE	0.43	8.36	2.90

NOTES: OFF-BASE = trips coming onto or leaving the base
ON-BASE = trips remaining within base boundaries
ROG = reactive organic gases (summer fuel volatility)
NOx = oxides of nitrogen (summer fuel volatility)
CO-S = carbon monoxide (summer fuel volatility)
CO-W = carbon monoxide (winter fuel volatility)
PMEX = exhaust particulate matter
PMTW = tire wear particulate matter
DRNL = diurnal evaporative emissions (grams/veh-day)
RSTL = resting loss evaporative emissions (g/veh-day)
SOAK = hot soak emission rate in grams/trip
ROAD DUST = resuspended road dust (PM10 grams/vmt)

TABLE D-50. EMFAC7F INPUT ASSUMPTIONS, NAF EL CENTRO GOVERNMENT VEHICLES

SUMMARY OF INPUT ASSUMPTIONS:

CALENDAR YEAR: 1999 I&M PROGRAM: YES

VEHICLE MIX ASSUMPTIONS:

LDA	LDT	MDT	HDG	HDD	BUS	MCY
5.00%	55.00%	29.50%	3.00%	6.50%	1.00%	0.00%

AIR TEMPERATURE FOR EXHAUST RATES, SUMMER: 90 WINTER: 60

EVAPORATIVE EMISSIONS TEMPERATURE PATTERNS:

	MINIMUM	8 AM	9 AM	11 AM	1 PM	MAXIMUM
SUMMER	78	81	85	96	101	105
WINTER	45	45	48	59	68	70

OPERATING MODE ASSUMPTIONS BY TRIP TYPE:

	COLD START	HOT START	HOT STABLE
OFF-BASE	31.70%	17.30%	51.00%
ON-BASE	39.82%	44.64%	15.54%

NOTES: LDA = light duty autos
LDT = light duty trucks
MDT = medium duty trucks
HDG = heavy duty gasoline-fueled vehicles
HDD = heavy duty diesel-fueled vehicles
BUS = diesel-fueled urban buses
MCY = motorcycles
OFF-BASE = trips coming onto or leaving the base
ON-BASE = trips remaining within base boundaries

TABLE D-51. 1999 EMISSION RATES, NAF EL CENTRO GOVERNMENT VEHICLES

POL-LUTANT	TRIP PURPOSE	GRAM/MILE RATES BY SPEED IN MPH 15	25	35	45	55
ROG	OFF-BASE	1.69	1.09	0.88	0.75	0.76
	ON-BASE	1.82	1.22	1.01	0.88	0.89
NOx	OFF-BASE	2.36	1.95	1.90	2.15	2.75
	ON-BASE	2.52	2.12	2.07	2.32	2.92
CO-S	OFF-BASE	13.10	9.96	8.57	7.96	8.66
	ON-BASE	14.95	11.81	10.42	9.81	10.51
CO-W	OFF-BASE	12.08	9.22	7.95	7.39	8.02
	ON-BASE	13.63	10.77	9.50	8.93	9.57
PMEX	OFF-BASE	0.14	0.14	0.14	0.14	0.14
	ON-BASE	0.14	0.14	0.14	0.14	0.14
PMTW	OFF-BASE	0.24	0.24	0.24	0.24	0.24
	ON-BASE	0.24	0.24	0.24	0.24	0.24

	SOAK	DRNL/RSTL	ROAD DUST
OFF-BASE	0.43	11.15	2.90
ON-BASE	0.43	11.15	2.90

NOTES: OFF-BASE = trips coming onto or leaving the base
ON-BASE = trips remaining within base boundaries
ROG = reactive organic gases (summer fuel volatility)
NOx = oxides of nitrogen (summer fuel volatility)
CO-S = carbon monoxide (summer fuel volatility)
CO-W = carbon monoxide (winter fuel volatility)
PMEX = exhaust particulate matter
PMTW = tire wear particulate matter
DRNL = diurnal evaporative emissions (grams/veh-day)
RSTL = resting loss evaporative emissions (g/veh-day)
SOAK = hot soak emission rate in grams/trip
ROAD DUST = resuspended road dust (PM10 grams/vmt)

TABLE D-52. COMPOSITE EMISSION FACTORS FOR GOVERNMENT VEHICLES

		EMISSION RATES, GRAMS PER VMT				
LOCATION	POLLUTANT	15 MPH	25 MPH	35 MPH	45 MPH	55 MPH
NAWS POINT MUGU ON-BASE	ROG	2.83	2.46	2.30	2.18	2.16
	NOx	2.65	2.22	2.16	2.43	3.06
	CO	14.13	11.10	9.75	9.15	9.84
	SOx	0.03	0.03	0.03	0.03	0.03
	PM10	3.28	3.28	3.28	3.28	3.28
NAWS POINT MUGU OFF-BASE	ROG	1.81	1.44	1.28	1.16	1.14
	NOx	2.45	2.02	1.96	2.23	2.86
	CO	12.57	9.54	8.19	7.59	8.28
	SOx	0.03	0.03	0.03	0.03	0.03
	PM10	3.28	3.28	3.28	3.28	3.28
NAS LEMOORE ON-BASE	ROG	3.88	3.35	3.16	3.03	3.04
	NOx	2.52	2.11	2.06	2.31	2.91
	CO	14.79	11.57	10.13	9.49	10.23
	SOx	0.03	0.03	0.03	0.03	0.03
	PM10	3.28	3.28	3.28	3.28	3.28
NAS LEMOORE OFF-BASE	ROG	2.13	1.60	1.41	1.28	1.28
	NOx	2.35	1.94	1.89	2.14	2.74
	CO	13.16	9.94	8.50	7.86	8.60
	SOx	0.03	0.03	0.03	0.03	0.03
	PM10	3.28	3.28	3.28	3.28	3.28
NAF EL CENTRO ON-BASE	ROG	4.62	4.02	3.81	3.68	3.69
	NOx	2.52	2.12	2.07	2.32	2.92
	CO	14.29	11.29	9.96	9.37	10.04
	SOx	0.03	0.03	0.03	0.03	0.03
	PM10	3.28	3.28	3.28	3.28	3.28
NAF EL CENTRO OFF-BASE	ROG	2.41	1.81	1.60	1.47	1.48
	NOx	2.36	1.95	1.90	2.15	2.75
	CO	12.59	9.59	8.26	7.68	8.34
	SOx	0.03	0.03	0.03	0.03	0.03
	PM10	3.28	3.28	3.28	3.28	3.28

NOTES: OFF-BASE = trips coming onto or leaving the base
ON-BASE = trips remaining within base boundaries
ROG = reactive organic gases (exhaust + evaporatives, summer rates)
NOx = oxides of nitrogen (summer rates)
CO = carbon monoxide (average of summer and winter rates)
SOx = sulfur oxides
PM10 = inhalable particulate matter (exhaust, tire wear, road dust)
Emission rates based on data in Tables D-47, D-49, and D-51.

TABLE D-53. ESTIMATED DISTRIBUTION OF GOVERMENT VEHICLE VMT BY AVERAGE ROUTE SPEED

TRIP CATEGORY	FRACTION OF TRIPS	MEAN TRIP DURATION (MINUTES)	PERCENT TIME AT AVERAGE ROUTE SPEED					AVERAGE TRIP DISTANCE (MILES)
			15 MPH	25 MPH	35 MPH	45 MPH	55 MPH	
ON-BASE	90%	9.7	20.0%	40.0%	35.0%	5.0%	0.0%	4.45
OFF-BASE	10%	22.5	5.0%	10.0%	20.0%	30.0%	35.0%	16.09
COMBINED		11.0						5.61

Trip fractions and mean trip durations from Table D-45.
Travel time distributions estimated.

TRIP CATEGORY	MEAN TRIP TIME (MINUTES)	AVERAGE TRIP DISTANCE (MILES)	PERCENT VMT BY AVERAGE ROUTE SPEED					FRACTION OF TOTAL VMT
			15 MPH	25 MPH	35 MPH	45 MPH	55 MPH	
ON-BASE	9.7	4.45	10.9%	36.4%	44.5%	8.2%	0.0%	71.3%
OFF-BASE	22.5	16.09	1.7%	5.8%	16.3%	31.4%	44.8%	28.7%

VMT distributions calculated from travel time distributions and speed assumptions.

TABLE D-54. ESTIMATED EMISSIONS FROM ADDED GOVERNMENT VEHICLE USE

LOCATION	GOV VEHICLE TRAVEL COMPONENT	ANNUAL VMT	EQUIVALENT TRIPS PER DAY	ESTIMATED EMISSIONS, TONS PER YEAR ROG	NOx	CO	SOx	PM10
NAWS POINT MUGU	ON-BASE	60,081	56.3	0.16	0.15	0.71	0.002	0.22
	OFF-BASE	24,159	6.3	0.03	0.07	0.22	0.001	0.09
	TOTAL	84,240	62.6	0.19	0.22	0.93	0.003	0.30
NAS LEMOORE	ON-BASE	60,081	56.3	0.22	0.14	0.74	0.002	0.22
	OFF-BASE	24,159	6.3	0.04	0.06	0.23	0.001	0.09
	TOTAL	84,240	62.6	0.25	0.21	0.96	0.003	0.30
NAF EL CENTRO	ON-BASE	60,081	56.3	0.26	0.14	0.72	0.002	0.22
	OFF-BASE	24,159	6.3	0.04	0.06	0.22	0.001	0.09
	TOTAL	84,240	62.6	0.30	0.21	0.94	0.003	0.30

NOTES: OFF-BASE = trips coming onto or leaving the base
ON-BASE = trips remaining within base boundaries
VMT = vehicle miles traveled
ROG = reactive organic gases (exhaust + evaporatives, summer rates)
NOx = oxides of nitrogen (summer rates)
CO = carbon monoxide (average of summer and winter rates)
SOx = sulfur oxides
PM10 = inhalable particulate matter (exhaust, tire wear, road dust)

The E-2 realignment will add 18 vehicles to the existing government vehicle fleet and contribute slightly to increased use of existing government vehicles.
Government vehicle vmt for the E-2 realignment estimated from historical NAWS Point Mugu data (19.5 miles per day per government vehicle. 240 work days per year).
On-base versus off-base VMT partitioning based on Table D-53.
Composite 1999 emission factors for government vehicles are summarized in Table D-52.

Carbon Monoxide Dispersion Modeling

TABLE D-55. EMISSION FACTOR ADJUSTMENTS FOR EXTENDED ENGINE IDLING TIME: STANDARDIZED IDLE ADJUSTMENT LINKS

INPUT VARIABLES	MUGU1	MUGU2	MUGU3	MUGU4	LEM1	LEM2	LEM3	LEM4	ELC1	ELC2	ELC3	ELC4
SPEED (MPH) FOR BASE EMISSION RATE	15	15	15	15	15	15	15	15	15	15	15	15
LINK LENGTH, FEET	500	500	500	500	500	500	500	500	500	500	500	500
DELAY PER VEHICLE, SECONDS OF IDLE	20	30	40	50	20	30	40	50	20	30	40	50
BASE EMISSION RATE, GM/MI	12.42	12.42	12.42	12.42	14.59	14.59	14.59	14.59	16.88	16.88	16.88	16.88
100% STABILIZED 5 MPH RATE, GM/MI	16.71	16.71	16.71	16.71	16.71	16.71	16.71	16.71	17.92	17.92	17.92	17.92
100% STABILIZED 16 MPH RATE, GM/MI	6.52	6.52	6.52	6.52	6.52	6.52	6.52	6.52	6.99	6.99	6.99	6.99
100% COLD START 16 MPH RATE, GM/MI	22.19	22.19	22.19	22.19	22.19	22.19	22.19	22.19	27.26	27.26	27.26	27.26
% CATALYST VEHICLES	98.05	98.05	98.05	98.05	98.05	98.05	98.05	98.05	98.05	98.05	98.05	98.05
% NON-CATALYST COLD STARTS	28.48	28.48	28.48	28.48	28.48	28.48	28.48	28.48	37.02	37.02	37.02	37.02
% CATALYST COLD STARTS	37.21	37.21	37.21	37.21	37.21	37.21	37.21	37.21	48.38	48.38	48.38	48.38
OUTPUT												
HOT STABILIZED IDLE RATE, GM/MIN	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.39	1.49	1.49	1.49	1.49
ADJUSTED COLD START 5 MPH RATE, GM/MI	56.87	56.87	56.87	56.87	56.87	56.87	56.87	56.87	69.89	69.89	69.89	69.89
COLD START IDLE RATE, GM/MIN	4.7392	4.7392	4.7392	4.7392	4.7392	4.7392	4.7392	4.7392	5.8238	5.8238	5.8238	5.8238
% IDLE TIME IN EMFAC/MOBILE RATES	25.39	25.39	25.39	25.39	25.39	25.39	25.39	25.39	25.39	25.39	25.39	25.39
IDLE SECONDS IN EMFAC/MOBILE RATES	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77	5.77
REQUIRED EXTRA IDLE SECONDS	14.23	24.23	34.23	44.23	14.23	24.23	34.23	44.23	14.23	24.23	34.23	44.23
WEIGHTED % COLD STARTS	37.04	37.04	37.04	37.04	37.04	37.04	37.04	37.04	48.16	48.16	48.16	48.16
WEIGHTED COLD/HOT IDLE RATE, GM/MIN	2.6321	2.6321	2.6321	2.6321	2.6321	2.6321	2.6321	2.6321	3.5788	3.5788	3.5788	3.5788
BASE EMISSION RATE, GM/MI	12.42	12.42	12.42	12.42	14.59	14.59	14.59	14.59	16.88	16.88	16.88	16.88
ADDED IDLE ADJUSTMENT, GM/MI	6.59	11.22	15.86	20.49	6.59	11.22	15.86	20.49	8.96	15.26	21.56	27.86
ADJUSTED EMISSION RATE, GM/MI	19.01	23.64	28.28	32.91	21.18	25.81	30.45	35.08	25.84	32.14	38.44	44.74
ADJUSTMENT FACTOR, % INCREASE	53.1%	90.4%	127.7%	165.0%	45.2%	76.9%	108.7%	140.4%	53.1%	90.4%	127.7%	165.0%

TABLE D-56. CALINE4 INPUT FILE FOR NAWS POINT MUGU ALTERNATIVE

```
   ' NAWS PT MUGU                                 '
   1 ,'CARBON MONOXIDE                '
  50 ,   28.01 ,    0 ,    0 ,    4 ,   13 , 0.3048 ,    1 ,    1 ,    0
   ' GATE 1N                   '
   ' GATE 1S                   '
   ' GATE 2N                   '
   ' GATE 2S                   '
12032 ,    7279 ,        5
12084 ,    7193 ,        5
10454 ,    9733 ,        5
10514 ,    9640 ,        5
   ' HWY 1 N WOOD              '
   ' HWY 1 WD-LAS POSAS        '
   ' HWY 1 S LAS POSAS         '
   ' FRONTAGE RD 1             '
   ' FRONTAGE RD 2             '
   ' FRONTAGE RD 3             '
   ' N MUGU RD                 '
   ' MAIN RD                   '
   ' LAS POSAS                 '
   ' IDLE FRNT1S               '
   ' IDLE FRNT2N               '
   ' IDLE FRNT2S               '
   ' IDLE FRNT3N               '
   1 ,    7097 ,   15613 ,    9462 ,   11828 ,  0 ,  76 ,    0 ,    0 ,    0
   1 ,    9462 ,   11828 ,   13484 ,    4436 ,  0 ,  76 ,    0 ,    0 ,    0
   1 ,   13484 ,    4436 ,   15495 ,    2543 ,  0 ,  76 ,    0 ,    0 ,    0
   1 ,    9758 ,   10941 ,   10527 ,    9758 ,  0 ,  58 ,    0 ,    0 ,    0
   1 ,   10527 ,    9758 ,   12124 ,    7274 ,  0 ,  58 ,    0 ,    0 ,    0
   1 ,   12124 ,    7274 ,   12952 ,    5855 ,  0 ,  58 ,    0 ,    0 ,    0
   1 ,   10527 ,    9758 ,    9285 ,    7688 ,  0 ,  58 ,    0 ,    0 ,    0
   1 ,   12124 ,    7274 ,    9758 ,    5914 ,  0 ,  58 ,    0 ,    0 ,    0
   1 ,   13484 ,    4436 ,   11946 ,    4731 ,  0 ,  58 ,    0 ,    0 ,    0
   1 ,   10254 ,   10177 ,   10527 ,    9758 ,  0 ,  58 ,    0 ,    0 ,    0
   1 ,   10527 ,    9758 ,   10797 ,    9337 ,  0 ,  58 ,    0 ,    0 ,    0
   1 ,   11860 ,    7699 ,   12124 ,    7274 ,  0 ,  58 ,    0 ,    0 ,    0
   1 ,   12124 ,    7274 ,   12388 ,    6849 ,  0 ,  58 ,    0 ,    0 ,    0
   1 ,       1 ,       1 ,       0 ,       1 ,'WIND DIR 1          '
1823 ,    1349 ,    1349 ,    1390 ,     690 ,      222 ,      700 ,      175 ,
 200 ,    1390 ,     690 ,     690 ,     222
8.57 ,    8.57 ,    8.57 ,    9.02 ,    9.02 ,     9.02 ,    12.42 ,    12.42 ,
12.42 ,   6.59 ,    6.59 ,    6.59 ,    6.59
   0 ,       1 ,       5 ,      50 ,      10 ,        0 ,       25
   1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 2          '
  10 ,       1 ,       5 ,      50 ,      10 ,        0 ,       25
   1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 3          '
  20 ,       1 ,       5 ,      50 ,      10 ,        0 ,       25
   1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 4          '
  30 ,       1 ,       5 ,      50 ,      10 ,        0 ,       25
```

TABLE D-56. CALINE4 INPUT FILE FOR NAWS POINT MUGU ALTERNATIVE

```
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 5           '
  40 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 6           '
  50 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 7           '
  60 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 8           '
  70 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 9           '
  80 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 10          '
  90 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 11          '
 100 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 12          '
 110 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 13          '
 120 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 14          '
 130 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 15          '
 140 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 16          '
 150 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 17          '
 160 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 18          '
 170 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 19          '
 180 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 20          '
 190 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 21          '
 200 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 22          '
 210 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 23          '
 220 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 24          '
 230 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 25          '
 240 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 26          '
 250 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 27          '
 260 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
   1 ,      0 ,      0 ,      0 ,      1 ,'WIND DIR 28          '
 270 ,      1 ,      5 ,     50 ,     10 ,      0 ,       25
```

TABLE D-56. CALINE4 INPUT FILE FOR NAWS POINT MUGU ALTERNATIVE

1 ,	0 ,	0 ,	0 ,	1 ,'WIND DIR 29		'
280 ,	1 ,	5 ,	50 ,	10 ,	0 ,	25
1 ,	0 ,	0 ,	0 ,	1 ,'WIND DIR 30		'
290 ,	1 ,	5 ,	50 ,	10 ,	0 ,	25
1 ,	0 ,	0 ,	0 ,	1 ,'WIND DIR 31		'
300 ,	1 ,	5 ,	50 ,	10 ,	0 ,	25
1 ,	0 ,	0 ,	0 ,	1 ,'WIND DIR 32		'
310 ,	1 ,	5 ,	50 ,	10 ,	0 ,	25
1 ,	0 ,	0 ,	0 ,	1 ,'WIND DIR 33		'
320 ,	1 ,	5 ,	50 ,	10 ,	0 ,	25
1 ,	0 ,	0 ,	0 ,	1 ,'WIND DIR 34		'
330 ,	1 ,	5 ,	50 ,	10 ,	0 ,	25
1 ,	0 ,	0 ,	0 ,	1 ,'WIND DIR 35		'
340 ,	1 ,	5 ,	50 ,	10 ,	0 ,	25
1 ,	0 ,	0 ,	0 ,	1 ,'WIND DIR 36		'
350 ,	1 ,	5 ,	50 ,	10 ,	0 ,	25

TABLE D-57. CALINE4 INPUT FILE FOR NAS LEMOORE ALTERNATIVE

```
  ' NAS LEMOORE                                    '
  1 ,'CARBON MONOXIDE                '
 50 ,   28.01 ,    0 ,    0 ,   4 ,    4 ,  0.3048 ,   1 ,   1 ,   0
  ' RECEPTOR 1          '
  ' RECEPTOR 2          '
  ' RECEPTOR 3          '
  ' RECEPTOR 4          '
1950 ,    2075 ,      5
2050 ,    2075 ,      5
1950 ,    1925 ,      5
2050 ,    1925 ,      5
  ' SR 198 W            '
  ' SR 198 E            '
  ' MAIN GATE N         '
  ' MAIN GATE S         '
  1 ,       0 ,   2000 ,   2000 ,   2000 ,   0 ,  48 ,   0 ,   0 ,   0
  1 ,    2000 ,   2000 ,   4000 ,   2000 ,   0 ,  76 ,   0 ,   0 ,   0
  1 ,    2000 ,      0 ,   2000 ,   2000 ,   0 ,  58 ,   0 ,   0 ,   0
  1 ,    2000 ,   2000 ,   2000 ,   4000 ,   0 ,  58 ,   0 ,   0 ,   0
  1 ,       1 ,      1 ,      0 ,      1 ,'WIND DIR 1         '
 457 ,    957 ,    600 ,    100
10.98 ,  10.98 ,  21.18 ,  10.95
  0 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 2         '
 10 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 3         '
 20 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 4         '
 30 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 5         '
 40 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 6         '
 50 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 7         '
 60 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 8         '
 70 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 9         '
 80 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 10        '
 90 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 11        '
100 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 12        '
110 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
  1 ,       0 ,      0 ,      0 ,      1 ,'WIND DIR 13        '
120 ,       1 ,      5 ,     50 ,     10 ,       0 ,      25
```

TABLE D-57. CALINE4 INPUT FILE FOR NAS LEMOORE ALTERNATIVE

```
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 14        '
130 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 15        '
140 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 16        '
150 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 17        '
160 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 18        '
170 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 19        '
180 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 20        '
190 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 21        '
200 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 22        '
210 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 23        '
220 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 24        '
230 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 25        '
240 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 26        '
250 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 27        '
260 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 28        '
270 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 29        '
280 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 30        '
290 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 31        '
300 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 32        '
310 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 33        '
320 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 34        '
330 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 35        '
340 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
  1 ,   0 ,   0 ,   0 ,   1 ,'WIND DIR 36        '
350 ,   1 ,   5 ,  50 ,  10 ,     0 ,    25
```

TABLE D-58. CALINE4 INPUT FILE FOR NAF EL CENTRO ALTERNATIVE

```
     ' NAF EL CENTRO                                      '
    1 ,'CARBON MONOXIDE                 '
   50 ,   28.01 ,       0 ,    0 ,   4 ,    8 ,  0.3048 ,   1 ,   1 ,    0
     ' RECEPTOR 1           '
     ' RECEPTOR 2           '
     ' RECEPTOR 3           '
     ' RECEPTOR 4           '
 1950 ,    2050 ,       5
 2050 ,    2050 ,       5
 1950 ,    1950 ,       5
 2050 ,    1950 ,       5
     ' EVENS HEWES W        '
     ' EVANS HEWES E        '
     ' FORRESTER N          '
     ' FORRESTER S          '
     ' IDLE EH W            '
     ' IDLE EH E            '
     ' IDLE F N             '
     ' IDLE F S             '
    1 ,       0 ,    2000 ,    2000 ,    2000 ,  0 ,  34 ,  0 ,  0 ,  0
    1 ,    2000 ,    2000 ,    4000 ,    2000 ,  0 ,  34 ,  0 ,  0 ,  0
    1 ,    2000 ,       0 ,    2000 ,    2000 ,  0 ,  34 ,  0 ,  0 ,  0
    1 ,    2000 ,    2000 ,    2000 ,    4000 ,  0 ,  34 ,  0 ,  0 ,  0
    1 ,    1500 ,    2000 ,    2000 ,    2000 ,  0 ,  34 ,  0 ,  0 ,  0
    1 ,    2000 ,    2000 ,    2500 ,    2000 ,  0 ,  34 ,  0 ,  0 ,  0
    1 ,    2000 ,    1500 ,    2000 ,    2000 ,  0 ,  34 ,  0 ,  0 ,  0
    1 ,    2000 ,    2000 ,    2000 ,    2500 ,  0 ,  34 ,  0 ,  0 ,  0
    1 ,       1 ,       1 ,       0 ,       1 ,'WIND DIR 1           '
  376 ,     613 ,     371 ,     612 ,     376 ,     613 ,     371 ,     612
13.24 ,   13.24 ,   13.24 ,   13.24 ,    12.6 ,    12.6 ,    12.6 ,    12.6
    0 ,       1 ,       5 ,      50 ,      10 ,       0 ,      25
    1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 2           '
   10 ,       1 ,       5 ,      50 ,      10 ,       0 ,      25
    1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 3           '
   20 ,       1 ,       5 ,      50 ,      10 ,       0 ,      25
    1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 4           '
   30 ,       1 ,       5 ,      50 ,      10 ,       0 ,      25
    1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 5           '
   40 ,       1 ,       5 ,      50 ,      10 ,       0 ,      25
    1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 6           '
   50 ,       1 ,       5 ,      50 ,      10 ,       0 ,      25
    1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 7           '
   60 ,       1 ,       5 ,      50 ,      10 ,       0 ,      25
    1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 8           '
   70 ,       1 ,       5 ,      50 ,      10 ,       0 ,      25
    1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 9           '
   80 ,       1 ,       5 ,      50 ,      10 ,       0 ,      25
    1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 10          '
   90 ,       1 ,       5 ,      50 ,      10 ,       0 ,      25
    1 ,       0 ,       0 ,       0 ,       1 ,'WIND DIR 11          '
  100 ,       1 ,       5 ,      50 ,      10 ,       0 ,      25
```

TABLE D-58. CALINE4 INPUT FILE FOR NAF EL CENTRO ALTERNATIVE

```
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 12         '
110 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 13         '
120 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 14         '
130 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 15         '
140 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 16         '
150 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 17         '
160 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 18         '
170 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 19         '
180 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 20         '
190 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 21         '
200 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 22         '
210 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 23         '
220 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 24         '
230 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 25         '
240 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 26         '
250 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 27         '
260 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 28         '
270 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 29         '
280 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 30         '
290 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 31         '
300 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 32         '
310 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 33         '
320 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 34         '
330 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 35         '
340 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
  1 ,     0 ,     0 ,     0 ,      1 ,'WIND DIR 36         '
350 ,     1 ,     5 ,    50 ,     10 ,      0 ,      25
```

Cumulative Emission Analysis for Introduction of F/A-18E/F Aircraft

TABLE D-59. ANNUAL EMISSIONS FOR F/A-18E/F INTRODUCTION, NAS LEMOORE ALTERNATIVE

		ESTIMATED ANNUAL EMISSIONS, TONS PER YEAR				
YEAR	EMISSIONS COMPONENT	REACTIVE ORGANIC COMPOUNDS	NITROGEN OXIDES	CARBON MONOXIDE	SULFUR OXIDES	PM10
1999	Construction Activity	1.42	20.74	9.71	2.08	14.35
	1999 CAA Conformity Total	1.42	20.74	9.71	2.08	14.35
2000	Construction Activity	0.89	12.83	6.37	1.29	8.20
	F/A-18 E/F Operations	116.99	121.20	501.01	3.90	62.93
	F/A-18 E/F Engine Run-Ups	5.11	4.75	25.08	0.17	2.65
	Aircraft Refueling	0.21	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	5.14	2.55	107.84	0.01	0.07
	Other Permit-Exempt Equipment	0.10	1.40	0.75	0.09	0.13
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	4.01	3.49	55.72	0.10	9.96
	2000 CAA Conformity Total	132.45	146.22	696.78	5.56	83.95
2001	Construction Activity	0.84	12.39	5.55	1.26	7.64
	F/A-18 E/F Operations	214.79	221.50	919.83	7.13	115.20
	F/A-18 E/F Engine Run-Ups	9.62	8.94	47.21	0.32	4.98
	Aircraft Refueling	0.38	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	9.44	4.68	198.01	0.03	0.14
	Other Permit-Exempt Equipment	0.19	2.63	1.41	0.16	0.24
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	5.22	4.54	72.43	0.12	12.95
	2001 CAA Conformity Total	240.47	254.68	1,244.44	9.02	141.16
2002	Construction Activity	0.78	11.57	5.23	1.17	7.37
	F/A-18 E/F Operations	235.86	238.24	1,009.83	7.70	124.81
	F/A-18 E/F Engine Run-Ups	11.72	10.89	57.54	0.38	6.08
	Aircraft Refueling	0.44	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	10.36	5.14	217.47	0.03	0.15
	Other Permit-Exempt Equipment	0.24	3.21	1.72	0.20	0.29
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	6.42	5.59	89.15	0.15	15.94
	2002 CAA Conformity Total	265.81	274.64	1,380.93	9.64	154.63

TABLE D-59. ANNUAL EMISSIONS FOR F/A-18E/F INTRODUCTION, NAS LEMOORE ALTERNATIVE

		ESTIMATED ANNUAL EMISSIONS, TONS PER YEAR				
YEAR	EMISSIONS COMPONENT	REACTIVE ORGANIC COMPOUNDS	NITROGEN OXIDES	CARBON MONOXIDE	SULFUR OXIDES	PM10
2003, 2004	F/A-18 E/F Operations	256.93	254.98	1,099.83	8.28	134.42
	F/A-18 E/F Engine Run-Ups	13.82	12.85	67.86	0.45	7.17
	Aircraft Refueling	0.49	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	11.29	5.60	236.93	0.03	0.16
	Other Permit-Exempt Equipment	0.28	3.79	2.03	0.24	0.34
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	8.02	6.99	111.44	0.19	19.93
	2003 CAA Conformity Total	290.84	284.20	1,518.09	9.19	162.02
2005	Added E/F less Replaced C/D Operations	259.35	258.68	1,136.18	8.29	134.64
	Added E/F less Replaced C/D Run-Ups	13.96	12.90	67.25	0.46	7.23
	Aircraft Refueling	0.49	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	11.29	5.60	236.93	0.03	0.16
	Other Permit-Exempt Equipment	0.28	3.79	2.03	0.24	0.34
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	8.02	6.99	111.44	0.19	19.93
	2005 CAA Conformity Total	293.40	287.95	1,553.82	9.20	162.30
2006	Added E/F less Replaced C/D Operations	261.77	262.38	1,172.53	8.30	134.85
	Added E/F less Replaced C/D Run-Ups	14.10	12.96	66.63	0.46	7.29
	Aircraft Refueling	0.49	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	11.29	5.60	236.93	0.03	0.16
	Other Permit-Exempt Equipment	0.28	3.79	2.03	0.24	0.34
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	8.02	6.99	111.44	0.19	19.93
	2006 CAA Conformity Total	295.96	291.71	1,589.55	9.21	162.57
2007	Added E/F less Replaced C/D Operations	264.19	266.08	1,208.88	8.31	135.07
	Added E/F less Replaced C/D Run-Ups	14.24	13.02	66.01	0.46	7.35
	Aircraft Refueling	0.49	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	11.29	5.60	236.93	0.03	0.16
	Other Permit-Exempt Equipment	0.28	3.79	2.03	0.24	0.34
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	8.02	6.99	111.44	0.19	19.93
	2007 CAA Conformity Total	298.52	295.47	1,625.28	9.22	162.85

TABLE D-59. ANNUAL EMISSIONS FOR F/A-18E/F INTRODUCTION, NAS LEMOORE ALTERNATIVE

		ESTIMATED ANNUAL EMISSIONS, TONS PER YEAR				
YEAR	EMISSIONS COMPONENT	REACTIVE ORGANIC COMPOUNDS	NITROGEN OXIDES	CARBON MONOXIDE	SULFUR OXIDES	PM10
2008	Added E/F less Replaced C/D Operations	266.62	269.78	1,245.22	8.32	135.29
	Added E/F less Replaced C/D Run-Ups	14.38	13.07	65.39	0.46	7.41
	Aircraft Refueling	0.49	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	11.29	5.60	236.93	0.03	0.16
	Other Permit-Exempt Equipment	0.28	3.79	2.03	0.24	0.34
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	8.02	6.99	111.44	0.19	19.93
	2008 CAA Conformity Total	301.08	299.22	1,661.01	9.24	163.12
2009	Added E/F less Replaced C/D Operations	269.04	273.48	1,281.57	8.33	135.50
	Added E/F less Replaced C/D Run-Ups	14.52	13.13	64.78	0.46	7.47
	Aircraft Refueling	0.49	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	11.29	5.60	236.93	0.03	0.16
	Other Permit-Exempt Equipment	0.28	3.79	2.03	0.24	0.34
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	8.02	6.99	111.44	0.19	19.93
	2009 CAA Conformity Total	303.64	302.98	1,696.74	9.25	163.40
2010	Added E/F less Replaced C/D Operations	271.46	277.18	1,317.92	8.34	135.72
	Added E/F less Replaced C/D Run-Ups	14.66	13.18	64.16	0.46	7.53
	Aircraft Refueling	0.49	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	11.29	5.60	236.93	0.03	0.16
	Other Permit-Exempt Equipment	0.28	3.79	2.03	0.24	0.34
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	8.02	6.99	111.44	0.19	19.93
	2010 CAA Conformity Total	306.20	306.74	1,732.48	9.26	163.68
2010	Base-Related CAA Conformity Analysis Emissions	306.20	306.74	1,732.48	9.26	163.68
	Engine Test Cell	4.91	33.31	149.21	0.53	2.70
	Other On-Base Permit Sources	1.68	0.15	0.11	0.00	0.05
	Off-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Additional Household Travel	21.01	19.27	251.26	0.58	59.93
	Maximum Annual Total Emissions	333.80	359.47	2,133.06	10.36	226.36

TABLE D-59. ANNUAL EMISSIONS FOR F/A-18E/F INTRODUCTION, NAS LEMOORE ALTERNATIVE

Notes: Construction emission estimates assume all aircraft-related facilities, one BEQ, and 100 units of family housing will be constructed in 1999. Other housing and personnel support facility construction is assumed to occur in stages during 2000-2002.

Phase 1 analyses assume that 20 FRS aircraft will arrive in 2000 and 16 FRS aircraft will arrive in 2001; in addition, one fleet squadron will arrive each year from 2000 through 2003.

Phase 2 aircraft arrivals will be one-for-one replacements of F/A-18C/D aircraft that are already based at NAS Lemoore, with aircraft for one squadron replaced each year from 2005 through 2010.

In-frame engine run-up emission estimates assume 57.4 low power run-ups (10 minutes) per aircraft per year plus 3.2 high power run-ups (28.5 minutes) per aircraft per year. Each run-up event tests a single engine.

Aircraft refueling emission estimates are based on 80% splash loading of aircraft fuel tanks at fuel pit facilities and 20% splash loading of fuel trucks with subsequent splash loading of aircraft; emission rates reflect monthly temperature patterns at NAS Lemoore.

Aircraft support equipment includes tow tractors and weapons loaders.

Other permit-exempt equipment includes portable or stationary engines used for pumps, fans, compressors, generators, hoists, hydraulic test stands, air start units, etc.

On-base natural gas use includes space heating and water heating for residential, office, and industrial buildings that do not have central boilers large enough to require APCD permits. Emissions are less than 0.005 tons per year for any pollutant.

Base-related vehicle traffic includes only work-related trips (240 days per year).

Engine test cell emission estimates assume 4.77 single engine tests per aircraft per year, 53% schedule checks (14 minutes) and 47% break-in tests (84.5 minutes).

Engine test cell emissions for 2010 include testing of Phase 1 aircraft engines plus the change in emissions when Phase 2 F/A-18E/F aircraft are substituted for F/A-18C/D aircraft.

Other on-base permit sources include boilers in hangars and BEQs; paint, solvent, and abrasive blasting facilities; and the Navy exchange gas station.

Off-base natural gas use includes space heating and water heating for off-base housing. Emissions are less than 0.005 tons per year for any pollutant.

Additional household vehicle travel is not related to on-base land uses, and includes all shopping and other trips.

Base-related and additional household vehicle travel emission estimates were calculated for full Phase 1 conditions; intermediate year vehicle emissions were estimated as a percent of 2003 emissions: 50% for 2000, 65% for 2001, and 80% for 2002. Phase 2 aircraft arrivals will not produce further increases in personnel.

Source: U.S. Navy. 1997. Draft Environmental Impact Statement for Development of Facilities to Support Basing U.S. Pacific Fleet F/A-18E/F Aircraft on the West Coast of the United States. Volume II: Technical Appendices. Engineering Field Activity West. San Bruno, CA.

TABLE D-60. ANNUAL EMISSIONS FOR F/A-18E/F INTRODUCTION, NAF EL CENTRO ALTERNATIVE

		ESTIMATED ANNUAL EMISSIONS, TONS PER YEAR				
YEAR	EMISSIONS COMPONENT	REACTIVE ORGANIC COMPOUNDS	NITROGEN OXIDES	CARBON MONOXIDE	SULFUR OXIDES	PM10
1999	Construction Activity	3.52	51.00	24.42	5.09	29.99
	1999 CAA Conformity Total	3.52	51.00	24.42	5.09	29.99
2000	Construction Activity	1.56	22.78	10.41	2.30	13.30
	F/A-18 E/F Operations	116.99	121.20	501.01	3.90	62.93
	F/A-18 E/F Engine Run-Ups	5.11	4.75	25.08	0.17	2.65
	Aircraft Refueling	0.30	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	5.14	2.55	107.84	0.01	0.07
	Other Permit-Exempt Equipment	0.10	1.40	0.75	0.09	0.13
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	3.88	2.86	35.79	0.08	8.02
	2000 CAA Conformity Total	133.08	155.53	680.89	6.54	87.11
2001	Construction Activity	0.91	13.42	6.06	1.36	6.96
	F/A-18 E/F Operations	214.79	221.50	919.83	7.13	115.20
	F/A-18 E/F Engine Run-Ups	9.62	8.94	47.21	0.32	4.98
	Aircraft Refueling	0.56	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	9.44	4.68	198.01	0.03	0.14
	Other Permit-Exempt Equipment	0.19	2.63	1.41	0.16	0.24
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	5.04	3.72	46.52	0.10	10.43
	2001 CAA Conformity Total	240.56	254.89	1,219.04	9.10	137.94
2002	Construction Activity	0.87	12.70	5.76	1.28	6.73
	F/A-18 E/F Operations	235.86	238.24	1,009.83	7.70	124.81
	F/A-18 E/F Engine Run-Ups	11.72	10.89	57.54	0.38	6.08
	Aircraft Refueling	0.65	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	10.36	5.14	217.47	0.03	0.15
	Other Permit-Exempt Equipment	0.24	3.21	1.72	0.20	0.29
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	6.21	4.57	57.26	0.12	12.83
	2002 CAA Conformity Total	265.91	274.76	1,349.57	9.73	150.89

TABLE D-60. ANNUAL EMISSIONS FOR F/A-18E/F INTRODUCTION, NAF EL CENTRO ALTERNATIVE

		ESTIMATED ANNUAL EMISSIONS, TONS PER YEAR				
YEAR	EMISSIONS COMPONENT	REACTIVE ORGANIC COMPOUNDS	NITROGEN OXIDES	CARBON MONOXIDE	SULFUR OXIDES	PM10
2003, 2004	F/A-18 E/F Operations	256.93	254.98	1,099.83	8.28	134.42
	F/A-18 E/F Engine Run-Ups	13.82	12.85	67.86	0.45	7.17
	Aircraft Refueling	0.73	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	11.29	5.60	236.93	0.03	0.16
	Other Permit-Exempt Equipment	0.28	3.79	2.03	0.24	0.34
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	7.76	5.72	71.57	0.15	16.04
	2003 CAA Conformity Total	290.81	282.93	1,478.22	9.15	158.13
2005	Construction Activity	1.72	24.34	12.19	2.41	12.27
	Added E/F vs Replaced C/D Operations	274.98	269.33	1,176.97	8.77	142.65
	Added E/F vs replaced C/D Run-Ups	15.03	13.86	71.09	0.50	7.89
	Aircraft Refueling	0.80	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	12.08	5.99	253.61	0.03	0.17
	Other Permit-Exempt Equipment	0.31	4.28	2.29	0.27	0.39
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	8.88	6.55	81.99	0.18	18.40
	2005 CAA Conformity Total	313.81	324.35	1,598.14	12.16	181.77
2006	Construction Activity	2.26	32.27	15.44	3.24	18.16
	Added E/F vs Replaced C/D Operations	293.04	283.67	1,254.10	9.26	150.89
	Added E/F vs replaced C/D Run-Ups	16.24	14.88	74.32	0.55	8.61
	Aircraft Refueling	0.87	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	12.88	6.38	270.28	0.04	0.19
	Other Permit-Exempt Equipment	0.35	4.78	2.56	0.30	0.43
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	10.00	7.39	92.42	0.20	20.75
	2006 CAA Conformity Total	335.63	349.38	1,709.12	13.58	199.02
2007	Construction Activity	1.73	24.89	12.53	2.47	12.96
	Added E/F vs Replaced C/D Operations	311.10	298.02	1,331.24	9.75	159.13
	Added E/F vs replaced C/D Run-Ups	17.45	15.90	77.55	0.59	9.32
	Aircraft Refueling	0.94	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	13.67	6.78	286.96	0.04	0.20
	Other Permit-Exempt Equipment	0.39	5.27	2.82	0.33	0.47
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	11.12	8.23	102.84	0.22	23.11
	2007 CAA Conformity Total	356.38	359.08	1,813.94	13.40	205.19

TABLE D-60. ANNUAL EMISSIONS FOR F/A-18E/F INTRODUCTION, NAF EL CENTRO ALTERNATIVE

		ESTIMATED ANNUAL EMISSIONS, TONS PER YEAR				
YEAR	EMISSIONS COMPONENT	REACTIVE ORGANIC COMPOUNDS	NITROGEN OXIDES	CARBON MONOXIDE	SULFUR OXIDES	PM10
2008	Construction Activity	0.87	12.85	6.07	1.28	6.32
	Added E/F vs Replaced C/D Operations	329.15	312.36	1,408.38	10.24	167.36
	Added E/F vs replaced C/D Run-Ups	18.65	16.92	80.78	0.64	10.04
	Aircraft Refueling	1.01	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	14.47	7.17	303.64	0.04	0.21
	Other Permit-Exempt Equipment	0.42	5.76	3.09	0.36	0.52
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	12.23	9.07	113.26	0.25	25.46
	2008 CAA Conformity Total	376.80	364.13	1,915.21	12.81	209.92
2009	Construction Activity	0.87	12.85	6.07	1.28	5.96
	Added E/F vs Replaced C/D Operations	347.21	326.71	1,485.51	10.74	175.60
	Added E/F vs replaced C/D Run-Ups	19.86	17.93	84.00	0.69	10.76
	Aircraft Refueling	1.08	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	15.26	7.57	320.32	0.04	0.22
	Other Permit-Exempt Equipment	0.46	6.26	3.35	0.39	0.56
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	13.35	9.90	123.69	0.27	27.82
	2009 CAA Conformity Total	398.09	381.22	2,022.94	13.40	220.92
2010	Added E/F vs Replaced C/D Operations	365.27	341.05	1,562.65	11.23	183.83
	Added E/F vs replaced C/D Run-Ups	21.07	18.95	87.23	0.73	11.48
	Aircraft Refueling	1.15	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	16.06	7.96	336.99	0.04	0.23
	Other Permit-Exempt Equipment	0.50	6.75	3.61	0.42	0.61
	On-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Added Base-Related Traffic	14.47	10.74	134.11	0.29	30.17
	2010 CAA Conformity Total	418.50	385.46	2,124.60	12.71	226.33
2010	Base-Related CAA Conformity Analysis Emissions	418.50	385.46	2,124.60	12.71	226.33
	Engine Test Cell	7.00	44.77	159.79	0.81	4.91
	Other On-Base Permit Sources	3.04	0.52	0.39	0.00	0.13
	Off-Base Natural Gas Use	0.00	0.00	0.00	0.00	0.00
	Additional Household Travel	42.20	37.16	385.29	1.12	115.95
	Maximum Annual Total Emissions	470.75	467.91	2,670.08	14.64	347.32

TABLE D-60. ANNUAL EMISSIONS FOR F/A-18E/F INTRODUCTION, NAF EL CENTRO ALTERNATIVE

Notes: Construction emission estimates for Phase 1 assume all aircraft-related facilities, one BEQ, the BOQ, and 100 units of family housing will be constructed in 1999. Other Phase 1 housing and personnel support facility construction is assumed to occur in stages during 2000-2002.

Construction emission estimates for Phase 2 assume that additional aircraft maintenance and training facilities plus 75 units of family housing will be constructed in 2005. Other equipment storage, warehousing, administrative offices, housing, and personnel support facilities are assumed to be constructed in stages between 2009.

Phase 1 analyses assume that 20 FRS aircraft will arrive in 2000 and 16 FRS aircraft will arrive in 2001; in addition, one fleet squadron will arrive each year from 2000 through 2003.

Phase 2 analyses assume that one fleet squadron will arrive each year from 2005 through 2010.

In-frame engine run-up emission estimates assume 57.4 low power run-ups (10 minutes) per aircraft per year plus 3.2 high power run-ups (28.5 minutes) per aircraft per year. Each run-up event tests a single engine.

Aircraft refueling emission estimates are based on 80% splash loading of aircraft fuel tanks at fuel pit facilities and 20% splash loading of fuel trucks with subsequent splash loading of aircraft; emission rates reflect monthly temperature patterns at NAF El Centro.

Aircraft support equipment includes tow tractors and weapons loaders.

Other permit-exempt equipment includes portable or stationary engines used for pumps, fans, compressors, generators, hoists, hydraulic test stands, air start units, etc.

On-base natural gas use includes space heating and water heating for residential, office, and industrial buildings that do not have central boilers large enough to require APCD permits. Emissions are less than 0.005 tons per year for any pollutant.

Base-related vehicle traffic includes only work-related trips (240 days per year).

Engine test cell emission estimates assume 4.77 single engine tests per aircraft per year, 53% schedule checks (14 minutes) and 47% break-in tests (84.5 minutes).

Other on-base permit sources include boilers in hangars and BEQs; paint, solvent, and abrasive blasting facilities; and the Navy exchange gas station.

Off-base natural gas use includes space heating and water heating for off-base housing. Emissions are less than 0.005 tons per year for any pollutant.

Additional household vehicle travel is not related to on-base land uses, and includes all shopping and other trips.

Phase 1 vehicle travel emission estimates were calculated for 2003 conditions; intermediate year vehicle emissions were estimated as a percent of 2003 emissions: 50% for 2000, 65% for 2001, and 80% for 2002.

Phase 2 vehicle travel emission estimates were calculated for 2010 conditions; intermediate year vehicle emissions were estimated as Phase 1 emissions plus one-sixth of the Phase 2 increment for each year between 2005 and 2010.

Source: U.S. Navy. 1997. Draft Environmental Impact Statement for Development of Facilities to Support Basing U.S. Pacific Fleet F/A-18E/F Aircraft on the West Coast of the United States. Volume II: Technical Appendices. Engineering Field Activity West. San Bruno, CA.

Clean Air Act Conformity Emissions Summary, NAWS Point Mugu Alternative

TABLE D-61. ANNUAL CONFORMITY EMISSIONS FOR E-2 SQUADRON ACTIVITY, NAWS POINT MUGU ALTERNATIVE

YEAR	EMISSIONS COMPONENT	ESTIMATED ANNUAL EMISSIONS, TONS PER YEAR: REACTIVE ORGANIC COMPOUNDS	NITROGEN OXIDES	CARBON MONOXIDE	SULFUR OXIDES	PM10
1998	Construction Activity	0.26	3.56	1.88	0.35	1.44
	E-2 Operations	1.51	7.37	2.24	0.31	1.85
	E-2 Engine Run-Ups	0.39	1.08	0.56	0.05	0.31
	Aircraft Fuel Transfers	0.05	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	0.56	0.93	10.63	0.06	0.07
	On-Base Natural Gas Use	0.00	0.02	0.02	0.00	0.00
	Personal Vehicle Work Trips	1.49	1.06	14.79	0.03	2.84
	Added Government Vehicle Use	0.06	0.07	0.31	0.00	0.10
	1998 CAA Conformity Total	4.32	14.09	30.44	0.79	6.62
1999	Construction Activity	0.00	0.00	0.00	0.00	0.00
	E-2 Operations	4.53	22.10	6.73	0.93	5.55
	E-2 Engine Run-Ups	1.17	3.24	1.69	0.14	0.93
	Aircraft Fuel Transfers	0.15	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	1.69	2.79	31.89	0.18	0.22
	On-Base Natural Gas Use	0.00	0.07	0.05	0.00	0.01
	Personal Vehicle Work Trips	4.46	3.18	44.38	0.08	8.51
	Added Government Vehicle Use	0.19	0.22	0.93	0.00	0.30
	1999 CAA Conformity Total	12.19	31.59	85.67	1.33	15.53
2000+	E-2 Operations	4.53	22.10	6.73	0.93	5.55
	E-2 Engine Run-Ups	1.17	3.24	1.69	0.14	0.93
	Aircraft Fuel Transfers	0.15	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	1.69	2.79	31.89	0.18	0.22
	On-Base Natural Gas Use	0.00	0.07	0.05	0.00	0.01
	Personal Vehicle Work Trips	4.46	3.18	44.38	0.08	8.51
	Added Government Vehicle Use	0.19	0.22	0.93	0.00	0.30
	2000+ CAA Conformity Total	12.19	31.59	85.67	1.33	15.53
	Maximum CAA Conformity Analysis Emissions	12.19	31.59	85.67	1.33	15.53
	De Minimis Threshold	25.00	25.00	na	na	na
	Above De Minimis Level?	NO	YES	NO	NO	NO
	On-base Emission Reductions Not Included in SIP Forecasts	-32.13	-39.48	-126.84	-20.16	-34.00
	Conformity Emissions Change	-19.95	-7.89	-41.17	-18.83	-18.47
	Conformity Offset Requirements	none	none	none	none	none

TABLE D-61. ANNUAL CONFORMITY EMISSIONS FOR E-2 SQUADRON ACTIVITY, NAWS POINT MUGU ALTERNATIVE

Notes: Construction emission estimates assume 4.2 acres disturbed and 3,000 hours of heavy equipment operation in 1998: no construction projects would be initiated in 1999.

Except for construction activity, 1998 emissions are assumed to be one-third of 1999 emissions, to reflect staggered squadron arrivals between July and December.

E-2 aircraft emissions for 1999 and later years are based on 1,009 sorties per year with 20,768 total flight operations per year.

In-frame engine run-up emission estimates are based on 51.6 30-minute engine tests plus 13 20-minute engine tests per year per aircraft (826 30-minute tests and 208 20-minute tests).

Aircraft fuel transfer emissions are based on 4.1 million gallons of JP-5 or JP-8 fuel used per year, with two splash-loading fuel transfers: 3 months of fuel transfers at 50 degrees F, 9 months of transfers at 60 degrees F.

Aircraft support equipment includes tow tractors, hydraulic test stands, and standby equipment items (such as generators, compressors, floodlight sets, portable air conditioning units, and aircraft engine air start units).

Aircraft support equipment emission estimates are based on 2,600 hours per year of tow tractor use, 585 hours per year of hydraulic test stand use, and 144 hours per year of standby equipment use.

On-base natural gas use emissions are based on 1.72 million cubic feet per year of natural gas use for space heating and water heating in added office, industrial, and personnel support buildings (10 BTU/hour/square foot heating energy demand).

Personal vehicle work trip emissions based on 240 work days per year.

Emissions from added government vehicle use based on 18 additional government vehicles, each driven an average of 19.5 miles per day, 240 days per year. Vehicle emission rates reflect a vehicle fleet weighted toward light, medium, and heavy duty trucks.

Emission reductions not included in the SIP forecasts are emission reductions that have occurred at NAWS Point Mugu between 1990 and 1996. Emission reductions have been quantified for aircraft operations, base-related personal vehicle travel, government vehicle travel, and natural gas use at on-base housing.

Data Sources:

ATAC Corporation. 1997. NAS Lemoore F/A-18E/F Introduction and E-2 Realignment Airfield and Airspace Operational Study. Draft Report.

Humn, Bruce D. (ed.). 1996. Fundamentals of Building Energy Dynamics.

George, Steve. 1998. 3-2-98 Fax, Vehicle Mileage Data for NAWS Point Mugu. Sent by Steve George, NAWS Point Mugu Environmental Divsion (Anteon Corporation) to Robert Sculley (Tetra Tech).

U.S. Environmental Protection Agency. 1985. Compilation of Air Pollutant Emission Factors. 4th Edition. Volumes I and II. (AP-42).

U.S. Environmental Protection Agency. 1991. Nonroad Engine and Vehicle Emissions Study - Report. (21A-2001).

U.S. Environmental Protection Agency. 1992. Procedures for Emission Inventory Preparation. Volume IV: Mobile Sources. (EPA-450/4-81-126d (revised)).

U.S. Environmental Protection Agency. 1993. Compilation of Air Pollutant Emission Factors. 4th Edition. Volume I, Supplement F. (AP-42).

U.S. Environmental Protection Agency. 1995. Compilation of Air Pollutant Emission Factors. 5th Edition. Volume I: Stationary Point and Area Sources. (AP-42).

U.S. Navy. 1990. Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines. (AESO Report No. 6-90).

U.S. Navy. 1997. Baseline Emission Reduction Study. NAWS Point Mugu Environmental Division.

U.S. Navy. 1997. Revised Emissions From All Sources For NAWS Point Mugu For 1990 And 1996. NAWS Point Mugu Environmental Division.

Ventura County Air Pollution Control District. 1994. Ventura County 1994 Air Quality Management Plan. Appendix L: 1990 Baseline Emission Inventory Documentation.

TABLE D-62. GROWTH FACTORS INCORPORATED INTO THE VENTURA COUNTY OZONE SIP EMISSION FORECASTS

GROWTH INDEX	EXAMPLE EMISSION SOURCE CATEGORIES	PROJECTED INCREASE OVER 1990 CONDITIONS				
		1996	1999	2000	2002	2005
No Growth	Residential Gas Combustion; Weed Abatement; Range Management Burns; Government Aircraft	0.0%	0.0%	0.0%	0.0%	0.0%
Military Aircraft	Commercial and Civil Aircraft; Jet Fuel Storage and Transfers	0.0%	0.0%	0.0%	0.0%	0.0%
Population	Unpaved Road Dust (non-farm); Permit-exempt Dry Cleaning; Auto Body Coating; Recreational Boating; Printing	7.3%	13.9%	16.1%	19.0%	23.3%
Total Dwelling Units	Architectural Coatings; Small Engine Utility Equipment; Water Heaters; Residential Wood Combustion; Asphalt Paving; Non-Agricultural Pesticide Use; Paved Road Entrained Dust	9.0%	16.6%	19.2%	22.8%	28.2%
Nonretail Employment	Industrial Process Fuel Combustion; Industrial Boilers; Permitted Dry Cleaning; Degreasing; Other Surface Coating; Industrial Solvent Use; Industrial Processes (Chemical, Mineral, Metal, Wood Products); Mobile Industrial Equipment	8.6%	18.0%	21.1%	26.1%	33.6%
Retail Employment	Commercial/Institutional Boilers; Commercial/Industrial Space Heaters; Stationary Engines; Commercial Building Construction and Demolition	3.6%	17.1%	22.0%	27.5%	34.0%
Vehicle Miles Traveled	On-Road Motor Vehicles	13.7%	20.5%	22.8%	27.3%	34.2%

Note: Growth indexes do not account for existing or anticipated emission control programs.

Data Source: Ventura County Air Pollution Control District. 1994. Ventura County 1994 Air Quality Management Plan. Table 9-1 and Table 9-3.
Ventura County Air Pollution Control District. 1994. Ventura County 1994 Air Quality Management Plan. Appendix E-94: Emission Forecasts Documentation. Table E-4.

TABLE D-63. SUMMARY OF 1990 - 1996 EMISSION REDUCTIONS AT NAWS POINT MUGU

		ESTIMATED ANNUAL EMISSIONS, TONS PER YEAR				
YEAR	EMISSION SOURCE CATEGORY	ROG	NOx	CO	SOx	PM10
1990	Aircraft Operations	61.40	103.40	188.70	25.20	50.70
	Personal Vehicle Work Trips	39.75	28.38	396.00	0.73	75.97
	Government Vehicle Use	5.47	6.14	26.43	0.08	8.71
	Natural Gas Use, Housing	0.14	1.82	0.78	0.01	0.00
	CAA Conformity Subtotal	106.76	139.74	611.91	26.02	135.37
	Engine Test Cells and Stands	1.24	8.80	5.90	nd	3.54
	Coating and Cleaning	10.39	0.00	0.00	0.00	0.00
	Diesel Engines	3.22	45.54	3.25	9.91	3.03
	Gasoline Engines	4.09	2.86	111.72	0.15	0.18
	Incinerator	0.01	0.08	0.01	nd	0.06
	Fuel Farm, JP-4 Jet Fuel	2.59	0.00	0.00	0.00	0.00
	Fuel Farm, Aviation Gasoline	2.71	0.00	0.00	0.00	0.00
	Fuel Farm, Vehicle Gasoline	1.95	0.00	0.00	0.00	0.00
	Fuel Oil Boilers	0.01	0.54	0.14	1.17	0.05
	Natural Gas Low NOx Boilers	0.00	0.00	0.00	0.00	0.00
	Propane Combustion	0.00	0.05	0.00	0.00	0.00
	Other Natural Gas Use	0.31	5.75	1.15	0.03	0.17
	Navy Exchange Gas Station	0.97	0.00	0.00	0.00	0.00
	Public Works Gas Station	0.26	0.00	0.00	0.00	0.00
	Stationary Source Subtotal	27.75	63.62	122.17	11.26	7.03
	Lawn Mowers	11.80	1.69	nd	nd	nd
	Other Emission Sources	11.80	1.69	0.00	0.00	0.00
	Total Base-Related Emissions	146.31	205.05	734.08	37.28	142.40
1990 Totals	CAA Conformity Subtotal	106.76	139.74	611.91	26.02	135.37
	Stationary Source Subtotal	27.75	63.62	122.17	11.26	7.03
	Other Emission Sources	11.80	1.69	0.00	0.00	0.00
	Total Base-Related Emissions	146.31	205.05	734.08	37.28	142.40

TABLE D-63. SUMMARY OF 1990 - 1996 EMISSION REDUCTIONS AT NAWS POINT MUGU

YEAR	EMISSION SOURCE CATEGORY	ESTIMATED ANNUAL EMISSIONS, TONS PER YEAR ROG	NOx	CO	SOx	PM10
1996	Aircraft Operations	33.12	67.19	97.04	5.11	23.83
	Personal Vehicle Work Trips	36.53	26.08	363.92	0.67	69.81
	Government Vehicle Use	4.86	5.45	23.46	0.07	7.73
	Fuel Farm, JP-8 Jet Fuel	0.00	0.00	0.00	0.00	0.00
	Natural Gas Use, Housing	0.12	1.54	0.65	0.01	0.00
	CAA Conformity Subtotal	74.63	100.26	485.07	5.86	101.37
	Engine Test Cells	0.13	2.40	1.14	0.46	1.15
	Coating and Cleaning	3.66	0.00	0.00	0.00	0.00
	Diesel Engines	1.64	23.26	1.66	5.06	1.55
	Gasoline Engines	3.45	2.41	94.16	0.13	0.15
	Incinerator	0.00	0.00	0.00	0.00	0.00
	Fuel Farm, Aviation Gasoline	2.71	0.00	0.00	0.00	0.00
	Fuel Farm, Vehicle Gasoline	1.95	0.00	0.00	0.00	0.00
	Fuel Oil Boilers	0.00	0.06	0.01	0.13	0.01
	Natural Gas Low NOx Boilers	0.09	0.71	0.35	0.01	0.05
	Propane Combustion	0.00	0.00	0.00	0.00	0.00
	Other Natural Gas Use	0.17	3.22	0.64	0.02	0.10
	Navy Exchange Gas Station	0.89	0.00	0.00	0.00	0.00
	Public Works Gas Station	0.21	0.00	0.00	0.00	0.00
	Stationary Source Subtotal	14.90	32.06	97.96	5.81	3.01
	Lawn Mowers	11.80	1.69	nd	nd	nd
	Other Emission Sources	11.80	1.69	0.00	0.00	0.00
	Total Base-Related Emissions	101.33	134.01	583.03	11.67	104.38
1996 Totals	CAA Conformity Subtotal	74.63	100.26	485.07	5.86	101.37
	Stationary Source Subtotal	14.90	32.06	97.96	5.81	3.01
	Other Emission Sources	11.80	1.69	0.00	0.00	0.00
	Total Base-Related Emissions	101.33	134.01	583.03	11.67	104.38

TABLE D-63. SUMMARY OF 1990 - 1996 EMISSION REDUCTIONS AT NAWS POINT MUGU

YEAR	EMISSION SOURCE CATEGORY	1990-1996 EMISSIONS CHANGE, TONS PER YEAR ROG	NOx	CO	SOx	PM10
1990-1996 Change	Aircraft Operations	-28.28	-36.21	-91.66	-20.09	-26.87
	Personal Vehicle Work Trips	-3.22	-2.30	-32.08	-0.06	-6.15
	Government Vehicle Use	-0.61	-0.69	-2.97	-0.01	-0.98
	Natural Gas Use, Housing	-0.02	-0.28	-0.13	0.00	0.00
	CAA Conformity Subtotal	-32.13	-39.48	-126.84	-20.16	-34.00
	Engine Test Cells and Stands	-1.11	-6.40	-4.76	0.46	-2.39
	Coating and Cleaning	-6.73	0.00	0.00	0.00	0.00
	Diesel Engines	-1.58	-22.28	-1.59	-4.85	-1.48
	Gasoline Engines	-0.64	-0.45	-17.56	-0.02	-0.03
	Incinerator	-0.01	-0.08	-0.01	0.00	-0.06
	Fuel Farm, JP-4 Jet Fuel	-2.59	0.00	0.00	0.00	0.00
	Fuel Farm, Aviation Gasoline	0.00	0.00	0.00	0.00	0.00
	Fuel Farm, Vehicle Gasoline	0.00	0.00	0.00	0.00	0.00
	Fuel Oil Boilers	-0.01	-0.48	-0.13	-1.04	-0.04
	Natural Gas Low NOx Boilers	0.09	0.71	0.35	0.01	0.05
	Propane Combustion	0.00	-0.05	0.00	0.00	0.00
	Other Natural Gas Use	-0.14	-2.53	-0.51	-0.01	-0.07
	Navy Exchange Gas Station	-0.08	0.00	0.00	0.00	0.00
	Public Works Gas Station	-0.05	0.00	0.00	0.00	0.00
	Stationary Source Subtotal	-12.85	-31.56	-24.21	-5.45	-4.02
	Lawn Mowers	0.00	0.00	0.00	0.00	0.00
	Other Emission Sources	0.00	0.00	0.00	0.00	0.00
	Total Base-Related Emissions	-44.98	-71.04	-151.05	-25.61	-38.02
1990-1996 Change	CAA Conformity Subtotal	-32.13	-39.48	-126.84	-20.16	-34.00
	Stationary Source Subtotal	-12.85	-31.56	-24.21	-5.45	-4.02
	Other Emission Sources	0.00	0.00	0.00	0.00	0.00
	Total Base-Related Emissions	-44.98	-71.04	-151.05	-25.61	-38.02

TABLE D-63. SUMMARY OF 1990 - 1996 EMISSION REDUCTIONS AT NAWS POINT MUGU

Notes: Emissions from aircraft operations in 1990 taken from the Ventura County 1994 ozone SIP document (Ventura County Air Pollution Control District 1994).

Emissions from aircraft operations in 1996 taken from NAWS Point Mugu Environmental Division staff analyses (Table D-66).

Personal vehicle work trip emissions for 1990 and 1996 extrapolated from 1999 personal vehicle work trip emissions for E-2 personnel (Table D-40, 996 personnel) using a 1990 workforce of 8,887 personnel and a 1996 workforce of 8,167 personnel.

Government vehicle use emissions based on 1990 and 1996 vehicle fleet vmt (Table D-67) and 1999 emission factors for a vehicle mix dominated by light, medium, and heavy duty trucks. See Table D-68.

To avoid the confounding effects of vehicle model year turnover in personal and government vehicle fleets, 1999 calendar year vehicle emssion rates have been applied to both 1990 and 1996 baseline vehicle travel data.

NAWS Point Mugu Environmental Division staff analyses (U.S. Navy 1997) used for all other emission source categories.

To ensure fair comparisons with Table D-61, CAA conformity subtotals include only those emission source categories that have been evaluated in connection with the E-2 realignment and which do not include stationary sources with air pollution control district permits.

Because in-frame engine run-ups for 1990 and 1996 are not sufficiently documented, the net reduction in engine run-up emissions has not been estimated.

Sources: Ventura County Air Pollution Control District. 1994. 1994 Ventura County Air Quality Management Plan, Appendix L-94: 1990 Baseline Emission Inventory Documentation.

U.S. Navy. 1997. Revised Emissions From All Sources For NAWS Point Mugu for 1990 and 1996. NAWS Point Mugu Environmental Division.

TABLE D-64. NAWS POINT MUGU AIRCRAFT EMISSIONS INCLUDED IN THE VENTURA COUNTY OZONE SIP

AIRCRAFT TYPE	FLIGHT ACTIVITY	ANNUAL NUMBER	ANNUAL EMISSIONS (TONS PER YEAR)				
			ROG	NOx	CO	SOx	PM10
P-3; C-130	LTO cycles	3,468	3.3	32.4	13.9	8.2	10.1
	T&G cycles	5,157	0.4	12.1	1.3	4.8	5.4
C-12	LTO cycles	373	1.0	0.2	1.3	0.1	0.0
	T&G cycles	917	0.02	0.01	0.1	0.02	0.0
A-7	LTO cycles	1,040	6.4	3.2	11.9	0.6	0.0
	T&G cycles	1,356	0.1	3.6	0.4	0.4	0.0
F-86	LTO cycles	286	3.3	0.4	2.8	0.2	1.0
	T&G cycles	230	0.02	0.3	0.1	0.1	0.3
A-3	LTO cycles	645	15.0	1.9	12.8	0.7	4.3
	T&G cycles	277	0.1	0.6	0.2	0.1	0.7
A-6	LTO cycles	63	0.3	0.1	0.9	0.04	0.4
	T&G cycles	343	0.03	0.4	0.3	0.1	0.8
F-4	LTO cycles	463	5.1	1.3	16.2	0.6	2.4
	T&G cycles	716	0.3	1.6	3.4	0.6	0.7
F-14	LTO cycles	1,114	7.3	5.1	16.7	1.5	3.3
	T&G cycles	1,318	0.3	4.8	5.1	1.3	1.1
F/A-18	LTO cycles	1,713	13.6	10.8	39.8	1.8	11.38
	T&G cycles	3,225	0.3	18.3	14.9	1.6	8.0
T-38	LTO cycles	295	1.6	0.3	12.3	0.3	0.0
	T&G cycles	0	0.0	0.0	0.0	0.0	0.0
H-46	LTO cycles	276	1.2	0.2	2.2	0.1	0.2
	T&G cycles	1,272	0.2	0.8	2.4	0.3	0.6
UH-1	LTO cycles	849	0.3	0.5	1.0	0.2	0.0
	T&G cycles	9,764	0.0	4.2	1.0	1.4	0.0
206B	LTO cycles	883	0.3	0.2	0.9	0.1	0.03
	T&G cycles	0	0.0	0.0	0.0	0.0	0.0
CV-440	LTO cycles	1,620	0.9	0.1	26.8	0.0	0.0
	T&G cycles	0	0.0	0.0	0.0	0.0	0.0

TABLE D-64. NAWS POINT MUGU AIRCRAFT EMISSIONS INCLUDED IN THE VENTURA COUNTY OZONE SIP

AIRCRAFT TYPE	FLIGHT ACTIVITY	ANNUAL NUMBER	ANNUAL EMISSIONS (TONS PER YEAR)				
			ROG	NOx	CO	SOx	PM10
TOTALS		37,663	61.4	103.4	188.7	25.2	50.7

Notes: LTO = landing and take-off
T&G = touch and go
ROG = reactive organic compound
NOx = nitrogen oxides
CO = carbon monoxide
SOx = sulfur oxides
PM10 = inhalable particulate matter

Data taken from Appendix L-94 of the 1994 Ventura County Air Quality Management Plan, pages L-222, L-223, L-224, L-228, and L-229; PM10 emissions extrapolated from TSP values using emissions summary ratio derived from data on page L-219.

TABLE D-65. AIRCRAFT REMOVED FROM NAWS POINT MUGU BETWEEN 1990 AND 1996

AIRCRAFT TYPE	NUMBER REMOVED	SQUADRON OR ACTIVITY	1990 LTO CYCLES	1990 T&G CYCLES
C-130	1	Air National Guard	51	178
C-12	2	PMTC flight test	373	917
A-7	14	VAQ-34; PMTC fight test	1,040	1,356
F-86	8	Target operations	286	230
A-3	7	VAQ-34	645	277
A-6	3	PMTC flight test	63	343
F-4	1	VX-4	42	65
F-14	2	VX-4	111	132
F/A-18	19	VX-4; VFA-305; PMTC flight test	1,714	3,225
H-46	3	SAR helicopters	276	1,272
UH-1	5	VXE-6	849	9,764
CV-440	2	Renown Aviation	720	0
TOTALS	67		6,169	17,759

Notes: LTO = landing and take-off
T&G = touch and go

Data Source: U.S. Navy. 1997. Revised Emissions From All Sources for NAWS Point Mugu for 1990 and 1996. NAWS Point Mugu Environmental Division.

TABLE D-66. ESTIMATED 1996 AIRCRAFT EMISSIONS FOR NAWS POINT MUGU

AIRCRAFT TYPE	ANNUAL LTO CYCLES	ANNUAL T&G CYCLES	ANNUAL EMISSIONS (TONS PER YEAR)				
			ROG	NOx	CO	SOx	PM10
P-3	1,166	1,424	2.23	17.06	4.95	1.19	4.97
C-130	2,036	1,866	3.60	27.11	8.50	1.91	8.03
C-12	0	0	0.00	0.00	0.00	0.00	0.00
A-7	0	0	0.00	0.00	0.00	0.00	0.00
F-86	0	0	0.00	0.00	0.00	0.00	0.00
A-3	0	0	0.00	0.00	0.00	0.00	0.00
A-6	0	0	0.00	0.00	0.00	0.00	0.00
F-4	596	452	6.73	2.15	21.47	0.29	3.65
F-14	2,142	434	14.09	10.68	32.25	0.93	3.46
F/A-18	420	366	3.38	4.08	9.83	0.19	1.21
T-38	373	266	1.33	0.18	9.47	0.16	0.83
H-46	0	0	0.00	0.00	0.00	0.00	0.00
UH-1	0	0	0.00	0.00	0.00	0.00	0.00
206B	884	0	0.15	0.12	0.46	0.05	0.02
CV-440	0	0	0.00	0.00	0.00	0.00	0.00
H-60	600	1,250	0.20	0.87	0.82	0.09	0.38
CV-340	90	0	0.75	0.03	5.24	0.02	0.01
CV-580	635	0	0.42	2.97	1.26	0.22	0.95
METROLINER	1,143	0	0.10	0.78	0.35	0.06	0.25
GENERAL AVIATION	754	0	0.05	0.01	1.83	0.00	0.00
OTHER CARRIERS	21	0	0.09	1.15	0.61	0.00	0.07

TABLE D-66. ESTIMATED 1996 AIRCRAFT EMISSIONS FOR NAWS POINT MUGU

AIRCRAFT TYPE	ANNUAL LTO CYCLES	ANNUAL T&G CYCLES	ANNUAL EMISSIONS (TONS PER YEAR)				
			ROG	NOx	CO	SOx	PM10
TOTALS	10,860	6,058	33.12	67.19	97.04	5.11	23.83

Notes: LTO = landing and take-off
T&G = touch and go
ROG = reactive organic compound
NOx = nitrogen oxides
CO = carbon monoxide
PM10 = inhalable particulate matter

Data Source: U.S. Navy. 1997. Revised Emisions From All Sources for NAWS Point Mugu for 1990 and 1996. NAWS Point Mugu Environmental Division.

TABLE D-67. NAWS POINT MUGU GOVERNMENT VEHICLE USE, 1990 - 1997

YEAR	NUMBER OF GOVERNMENT VEHICLES	PER VEHICLE AVERAGES		ANNUAL CUMUALTIVE VMT
		VMT/YEAR	VMT/DAY	
1990	no data	no data	no data	2,406,191
1992	481	5,033	20.97	2,420,873
1993	480	5,450	22.71	2,616,000
1994	494	4,802	20.01	2,372,188
1995	506	4,818	20.08	2,437,908
1996	505	4,230	17.63	2,136,150
1997	509	3,750	15.63	1,908,750
MEAN (1992-97)	496	4,681	19.50	2,315,312

Source: Data provided by NAWS Point Mugu staff.

TABLE D-68. ESTIMATED CHANGE IN NAWS PT MUGU GOVERNMENT VEHICLE EMISSIONS, 1990 TO 1996 BASELINES

CONDITION	GOV VEHICLE TRAVEL COMPONENT	ANNUAL VMT	ESTIMATED EMISSIONS, TONS PER YEAR				
			ROG	NOx	CO	SOx	PM10
1990 BASELINE	ON-BASE	1,716,129	4.56	4.27	20.19	0.06	6.21
	OFF-BASE	690,062	0.91	1.87	6.24	0.02	2.50
	TOTAL	2,406,191	5.47	6.14	26.43	0.08	8.71
1996 BASELINE	ON-BASE	1,523,532	4.04	3.79	17.92	0.05	5.51
	OFF-BASE	612,618	0.81	1.66	5.54	0.02	2.22
	TOTAL	2,136,150	4.86	5.45	23.46	0.07	7.73
1990-1996 CHANGE	ON-BASE	(192,597)	-0.51	-0.48	-2.27	-0.01	-0.70
	OFF-BASE	(77,444)	-0.10	-0.21	-0.70	-0.00	-0.28
	TOTAL	(270,041)	-0.61	-0.69	-2.97	-0.01	-0.98

NOTES: OFF-BASE = trips coming onto or leaving the base
ON-BASE = trips remaining within base boundaries
VMT = vehicle miles traveled
ROG = reactive organic gases (exhaust + evaporatives, summer rates)
NOx = oxides of nitrogen (summer rates)
CO = carbon monoxide (average of summer and winter rates)
SOx = sulfur oxides
PM10 = inhalable particulate matter (exhaust, tire wear, road dust)

Total VMT estimates for government vehicles from NAWS Point Mugu staff (see Table D-67).
On-base versus off-base VMT partitioning based on Table D-53.
To avoid the confounding effects of vehicle model year turnover in the government vehicle fleet, 1999 calendar year vehicle emission rates have been applied to both the 1990 and 1996 baseline vmt values.
Composite 1999 emission factors for government vehicles are summarized in Table D-52.

Clean Air Act Conformity Emissions Summary, NAS Lemoore Alternative

TABLE D-69. ANNUAL CONFORMITY EMISSIONS FOR E-2 SQUADRON ACTIVITY, NAS LEMOORE ALTERNATIVE

YEAR	EMISSIONS COMPONENT	ESTIMATED ANNUAL EMISSIONS, TONS PER YEAR: REACTIVE ORGANIC COMPOUNDS	NITROGEN OXIDES	CARBON MONOXIDE	SULFUR OXIDES	PM10
1998	Construction Activity	1.07	17.23	7.90	1.78	8.83
	E-2 Operations	1.51	7.37	2.24	0.31	1.85
	E-2 Engine Run-Ups	0.39	1.08	0.56	0.05	0.31
	Aircraft Fuel Transfers	0.06	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	0.56	0.93	10.63	0.06	0.07
	On-Base Natural Gas Use	0.01	0.13	0.10	0.00	0.02
	Personal Vehicle Work Trips	1.32	0.92	14.23	0.03	2.68
	Added Government Vehicle Use	0.08	0.07	0.32	0.00	0.10
	1998 CAA Conformity Total	5.00	27.73	35.98	2.22	13.86
1999	Construction Activity	0.17	2.70	1.35	0.27	1.32
	E-2 Operations	4.53	22.10	6.73	0.93	5.55
	E-2 Engine Run-Ups	1.17	3.24	1.69	0.14	0.93
	Aircraft Fuel Transfers	0.17	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	1.69	2.79	31.89	0.18	0.22
	On-Base Natural Gas Use	0.02	0.38	0.29	0.00	0.06
	Personal Vehicle Work Trips	3.95	2.77	42.69	0.08	8.03
	Added Government Vehicle Use	0.25	0.21	0.96	0.00	0.30
	1999 CAA Conformity Total	11.94	34.19	85.60	1.60	16.41
2000+	E-2 Operations	4.53	22.10	6.73	0.93	5.55
	E-2 Engine Run-Ups	1.17	3.24	1.69	0.14	0.93
	Aircraft Fuel Transfers	0.17	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	1.69	2.79	31.89	0.18	0.22
	On-Base Natural Gas Use	0.02	0.38	0.29	0.00	0.06
	Personal Vehicle Work Trips	3.95	2.77	42.69	0.08	8.03
	Added Government Vehicle Use	0.25	0.21	0.96	0.00	0.30
	2000+ CAA Conformity Total	11.78	31.48	84.25	1.33	15.10
	Maximum CAA Conformity Analysis Emissions	11.94	34.19	85.60	2.22	16.41
	De Minimis Threshold	50.00	50.00	na	na	70.00
	Above De Minimis Level?	NO	NO	NO	NO	NO
	NAS Lemoore Activity Increase Forecast in SIP	14.60	65.70	0.00	0.00	0.00
	Conformity Emissions Change	-2.66	-31.51	85.60	2.22	16.41
	Conformity Offset Requirements	none	none	none	none	none

TABLE D-69. ANNUAL CONFORMITY EMISSIONS FOR E-2 SQUADRON ACTIVITY, NAS LEMOORE ALTERNATIVE

Notes: Construction emission estimates assume 21 acres disturbed and 12,180 hours of heavy equipment operation in 1998, 4.5 acres disturbed and 1,990 hours of heavy equipment operation in 1999.

Except for construction activity, 1998 emissions are assumed to be one-third of 1999 emissions, to reflect staggered squadron arrivals between July and December.

E-2 aircraft operations for 1999 and later years assume 1,009 sorties per year with 20,768 total flight operations per year.

In-frame engine run-up emission estimates assume 51.6 30-minute engine tests plus 13 20-minute engine tests year per aircraft (826 30-minute tests and 208 20-minute tests).

Aircraft fuel transfer emission estimates assume 4.1 million gallons of JP-5 fuel used per year, with two splash-loading fuel transfers; 1 month of fuel transfers at 40 degrees F, 4 months of transfers at 50 degrees F, 1 month of fuel transfers at 60 degrees F, 4 months of fuel transfers at 70 degrees F, and 2 months of fuel transfers at 80 degrees F.

Aircraft support equipment includes tow tractors, hydraulic test stands, and standby equipment items (such as generators, compressors, floodlight sets, portable air conditioning units, and aircraft engine air start units).

Aircraft support equipment emission estimates are based on 2,600 hours per year of tow tractor use, 585 hours per year of hydraulic test stand use, and 144 hours per year of standby equipment use.

On-base natural gas use emissions assume 9.37 million cubic feet per year of natural gas use for space heating and water heating in added office, industrial, and personnel support buildings (10 BTU/hour/square foot heating energy demand).

Personal vehicle work trip emissions based on 240 work days per year.

Emissions from added government vehicle use based on 18 additional government vehicles, each driven an average of 19.5 miles per day, 240 days per year. Vehicle emission rates reflect a vehicle fleet weighted toward light, medium, and heavy duty trucks.

The ozone SIP for the San Joaquin Valley anticipated increased aircraft emissions at NAS Lemoore between 1990 and 1996.

Data Sources:

ATAC Corporation. 1997. NAS Lemoore F/A-18E/F Introduction and E-2 Realignment Airfield and Airspace Operational Study. Draft Report.

Hunn, Bruce D. (ed.). 1996. Fundamentals of Building Energy Dynamics.

U.S. Environmental Protection Agency. 1985. Compilation of Air Pollutant Emission Factors. 4th Edition. Volumes I and II. (AP-42).

U.S. Environmental Protection Agency. 1991. Nonroad Engine and Vehicle Emissions Study Report. (21A-2001).

U.S. Environmental Protection Agency. 1992. Procedures for Emission Inventory Preparation. Volume IV: Mobile Sources. (EPA-450/4-81-126d (revised)).

U.S. Environmental Protection Agency. 1993. Compilation of Air Pollutant Emission Factors. 4th Edition. Volume I, Supplement F. (AP-42).

U.S. Environmental Protection Agency. 1995. Compilation of Air Pollutant Emission Factors. 5th Edition. Volume I: Stationary Point and Area Sources. (AP-42).

U.S. Navy. 1990. Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines. (AESO Report No. 6-90).

U.S. Navy. 1997. Baseline Emission Reduction Study. NAWS Point Mugu Environmental Division.

U.S. Navy. 1997. Revised Emissions From All Sources For NAWS Point Mugu For 1990 And 1996. NAWS Point Mugu Environmental Division.

San Joaquin Valley Unified Air Pollution Control District. 1995. Draft Revised Post 1996 Rate of Progress Plan.

Clean Air Act Conformity Emissions Summary, NAF El Centro Alternative

TABLE D-70. ANNUAL CONFORMITY EMISSIONS FOR E-2 SQUADRON ACTIVITY, NAF EL CENTRO ALTERNATIVE

YEAR	EMISSIONS COMPONENT	ESTIMATED ANNUAL EMISSIONS, TONS PER YEAR: REACTIVE ORGANIC COMPOUNDS	NITROGEN OXIDES	CARBON MONOXIDE	SULFUR OXIDES	PM10
1998	Construction Activity	1.13	18.20	8.33	1.88	7.27
	E-2 Operations	1.51	7.37	2.24	0.31	1.85
	E-2 Engine Run-Ups	0.39	1.08	0.56	0.05	0.31
	Aircraft Fuel Transfers	0.08	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	0.56	0.93	10.63	0.06	0.07
	On-Base Natural Gas Use	0.01	0.19	0.15	0.00	0.03
	Personal Vehicle Work Trips	1.32	0.92	14.23	0.03	2.68
	Added Government Vehicle Use	0.10	0.07	0.31	0.00	0.10
	1998 CAA Conformity Total	5.11	28.76	36.45	2.32	12.31
1999	Construction Activity	0.17	2.70	1.35	0.27	2.36
	E-2 Operations	4.53	22.10	6.73	0.93	5.55
	E-2 Engine Run-Ups	1.17	3.24	1.69	0.14	0.93
	Aircraft Fuel Transfers	0.25	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	1.69	2.79	31.89	0.18	0.22
	On-Base Natural Gas Use	0.03	0.58	0.44	0.00	0.09
	Personal Vehicle Work Trips	3.95	2.77	42.69	0.08	8.03
	Added Government Vehicle Use	0.30	0.21	0.94	0.00	0.30
	1999 CAA Conformity Total	12.08	34.39	85.73	1.60	17.49
2000+	E-2 Operations	4.53	22.10	6.73	0.93	5.55
	E-2 Engine Run-Ups	1.17	3.24	1.69	0.14	0.93
	Aircraft Fuel Transfers	0.25	0.00	0.00	0.00	0.00
	Aircraft Support Equipment	1.69	2.79	31.89	0.18	0.22
	On-Base Natural Gas Use	0.03	0.58	0.44	0.00	0.09
	Personal Vehicle Work Trips	3.95	2.77	42.69	0.08	8.03
	Added Government Vehicle Use	0.30	0.21	0.94	0.00	0.30
	2000+ CAA Conformity Total	11.92	31.69	84.38	1.33	15.13
	Maximum CAA Conformity Analysis Emissions	12.08	34.39	85.73	2.32	17.49
	De Minimis Threshold	100.00	100.00	na	na	100.00
	Above De Minimis Level?	NO	NO	NO	NO	NO
	NAF El Centro Activity Increase Forecast in SIP	0.00	0.00	0.00	0.00	0.00
	Conformity Emissions Change	12.08	34.39	85.73	2.32	17.49
	Conformity Offset Requirements	none	none	none	none	none

TABLE D-70. ANNUAL CONFORMITY EMISSIONS FOR E-2 SQUADRON ACTIVITY, NAF EL CENTRO ALTERNATIVE

Notes: Construction emission estimates assume 21.5 acres disturbed and 12,875 hours of heavy equipment operation in 1998, 4.3 acre disturbed and 1,990 hours of heavy equipment operation in 1999.

Except for construction activity, 1998 emissions are assumed to be one-third of 1999 emissions, to reflect staggered squadron arrivals between July and December.

E-2 aircraft operations for 1999 and later years assume 1,009 sorties per year with 20,768 total flight operations per year.

In-frame engine run-up emission estimates assume 51.6 30-minute engine tests plus 13 20-minute engine tests year per aircraft (826 30-minute tests and 208 20-minute tests).

Aircraft fuel transfer emission estimates assume 4.1 million gallons of JP-5 fuel used per year, with two splash-loading fuel transfers; 5 months of transfers at 60 degrees F, 1 month of fuel transfers at 70 degrees F, 2 months of fuel transfers at 80 degrees F, and 4 months of fuel transfers at 90 degrees F.

Aircraft support equipment includes tow tractors, hydraulic test stands, and standby equipment items (such as generators, compressors, floodlight sets, portable air conditioning units, and aircraft engine air start units).

Aircraft support equipment emission estimates are based on 2,600 hours per year of tow tractor use, 585 hours per year of hydraulic test stand use, and 144 hours per year of standby equipment use.

On-base natural gas use emissions assume 9.37 million cubic feet per year of natural gas use for space heating and water heating in added office, industrial, and personnel support buildings (10 BTU/hour/square foot heating energy demand).

Personal vehicle work trip emissions based on 240 work days per year.

Emissions from added government vehicle use based on 18 additional government vehicles, each driven an average of 19.5 miles per day, 240 days per year. Vehicle emission rates reflect a vehicle fleet weighted toward light, medium, and heavy duty trucks.

Data Sources:

ATAC Corporation. 1997. NAS Lemoore F/A-18E/F Introduction and E-2 Realignment Airfield and Airspace Operational Study. Draft Report.

Hunn, Bruce D. (ed.). 1996. Fundamentals of Building Energy Dynamics.

George, Steve. 1998. 3-2-98 Fax, Vehicle Mileage Data for NAWS Point Mugu. Sent by Steve George, NAWS Point Mugu Environmental Divsion (Anteon Corporation) to Robert Sculley (Tetra Tech).

U.S. Environmental Protection Agency. 1985. Compilation of Air Pollutant Emission Factors. 4th Edition. Volumes I and II. (AP-42).

U.S. Environmental Protection Agency. 1991. Nonroad Engine and Vehicle Emissions Study - Report. (21A-2001).

U.S. Environmental Protection Agency. 1992. Procedures for Emission Inventory Preparation. Volume IV: Mobile Sources. (EPA-450/4-81-126d (revised)).

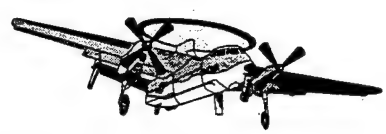
U.S. Environmental Protection Agency. 1993. Compilation of Air Pollutant Emission Factors. 4th Edition. Volume I, Supplement F. (AP-42).

U.S. Environmental Protection Agency. 1995. Compilation of Air Pollutant Emission Factors. 5th Edition. Volume I: Stationary Point and Area Sources. (AP-42).

U.S. Navy. 1990. Summary Tables of Gaseous and Particulate Emissions from Aircraft Engines. (AESO Report No. 6-90).

U.S. Navy. 1997. Baseline Emission Reduction Study. NAWS Point Mugu Environmental Division.

U.S. Navy. 1997. Revised Emissions From All Sources For NAWS Point Mugu For 1990 And 1996. NAWS Point Mugu Environmental Division.



Appendix E. Noise

APPENDIX E
NOISE

E.1 NOISE MEASUREMENTS AND TERMINOLOGY

E.1.1 Introduction

Sound is caused by vibrations that generate waves of minute air pressure fluctuations in the air. Air pressure fluctuations that occur from 20 to 20,000 times per second can be detected as audible sound. The number of pressure fluctuations per second is normally reported as cycles per second or Hertz. Different vibrational frequencies produce different tonal qualities for the resulting sound.

Sound level meters typically report measurements as an overall decibel (dB) value. Decibel scales are a logarithmic index based on ratios between a measured value and a reference value. In the field of acoustics, decibel scales are based on ratios of the actual pressure fluctuations generated by sound waves compared to a standard reference pressure value of 20 micropascals.

Measurements and descriptions of sounds are usually based on various combinations of the following factors:

- the vibrational frequency characteristics of the sound, measured as sound wave cycles per second (Hertz); this determines the "pitch" of a sound;

- the total sound energy being radiated by a source, usually reported as a sound power level;

- the actual air pressure changes experienced at a particular location, usually measured as a sound pressure level; the frequency characteristics and sound pressure level combine to determine the "loudness" of a sound at a particular location;

- the duration of a sound; and

- the changes in frequency characteristics or pressure levels through time.

Modern sound level meters measure the actual air pressure fluctuations at a number of different frequency ranges, most often using octave or 1/3 octave intervals. The pressure measurements at each frequency interval are converted to a decibel index and adjusted for a selected frequency weighting system. The different adjusted decibel values for the octave or 1/3 octave bands are then combined into a composite sound pressure level for the appropriate decibel scale. Most sound level meters do not save or report the detailed frequency band pressure level measurements. A more sophisticated and expensive instrument (a spectrum analyzer) is required to obtain dB measurements for discrete frequency bands.

E.1.2 General Purpose Decibel Scales

Human hearing varies in sensitivity for different sound frequencies. The ear is most sensitive to sound frequencies between 800 and 8,000 Hertz, and is least sensitive to sound frequencies below 250 Hertz or above 16,000 Hertz. Consequently, several different frequency weighting schemes have been used to approximate the way the human ear responds to noise levels. The "A-weighted" decibel scale (dBA) is the most widely used for this purpose, with different dB adjustment values specified for each octave or 1/3 octave interval. The A-weighted scale significantly reduces the measured pressure level for low frequency sounds while slightly increasing the measured pressure level for some middle frequency sounds.

Other frequency weighting schemes are used for specialized purposes. The "C-weighted" decibel scale (dBC) is often used to characterize low frequency sounds capable of inducing vibrations in buildings or other structures. The C-weighted scale does not significantly reduce the measured pressure level for low frequency components of a sound.

Unweighted decibel measurements are frequently used for refined analyses that require data on the frequency spectrum of a sound (e.g., sound absorption or sound transmission properties of materials). Unweighted decibel measurements are sometimes termed flat or linear measurements or overall sound pressure levels.

Varying noise levels are often described in terms of the equivalent constant decibel level. Equivalent noise levels (Leq) are used to develop single-value descriptions of average noise exposure over various periods of time. Such average noise exposure ratings often include additional weighting factors for potential annoyance due to time of day or other considerations. The Leq data used for these average noise exposure descriptors are generally based on A-weighted sound level measurements.

Statistical descriptions (Lx, where x represents the percent of the time when noise levels exceed the specified decibel level) are also used to characterize noise conditions over specified periods of time. L1, L5, and L10 descriptors are commonly used to characterize peak noise levels, while L90, L95, and L99 descriptors are commonly used to characterize "background" noise levels. It should be noted that the L50 value (the sound level exceeded 50 percent of the time) will seldom be the same as the Leq value for the period being analyzed. The Leq value is often between the L30 and the L50 values for the measurement period.

E.1.3 Decibel Scales Reflecting Annoyance Potential

Average noise exposure over a 24-hour period is often presented as a day-night average sound level (Ldn). Ldn values are calculated from hourly Leq values, with the Leq values for the nighttime period (10 p.m. - 7 a.m.) increased by 10 dB to reflect the greater disturbance potential from nighttime noises.

The community noise equivalent level (CNEL) is also used to characterize average noise levels over a 24-hour period, with weighting factors for evening and nighttime noise levels. Leq values for the evening period (7 p.m. - 10 p.m.) are increased by 5 dB while Leq values for the nighttime period (10 p.m. - 7 a.m.) are increased by 10 dB. The CNEL value will be slightly higher than (but generally within 1 dB of) the Ldn value for the same set of noise measurements. Only in situations with high evening period noise levels will CNEL values be meaningfully different from Ldn values.

It should be noted that single-value average noise descriptors (such as Ldn or CNEL values) are most appropriately applied to variable but relatively continuous sources of noise. Typical urban noise conditions, highway traffic, and major commercial airports are examples where CNEL and Ldn descriptors are most appropriate.

E.1.4 Noise Descriptors for Discrete Noise Events

The annoyance potential of intermittent or short-duration noise events can be difficult to evaluate from 24-hour average noise descriptors. Railroad operations, aircraft activity at general aviation airports, testing of emergency generators, pile driving, and blasting activities sometimes require evaluations using other types of noise descriptors. Peak noise levels, the duration of individual noise events, and the repetition pattern of events are often used to describe intermittent or short duration noise conditions. Statistical descriptions (Lx values) and event-specific Leq values also can be used to characterize discrete noise events.

Impulse sounds usually are defined as noise events producing a significant increase in sound level but lasting less than two seconds (often less than one second). Examples of impulse noise sources include pile driving, punch presses, gunshots, fireworks, and blasting activities. Impulse noises are usually described using the sound exposure level (SEL) descriptor. The SEL measure represents the

cumulative (not average) sound exposure during a particular noise event, integrated with respect to a one-second time frame.

Individual noise events of greater duration sometimes are characterized using the single event noise exposure level (SENEL) descriptor. The SENEL of a noise event is calculated as the cumulative A-weighted sound exposure during a discrete noise event, integrated with respect to a one-second time frame.

Mathematically, the SEL and SENEL descriptors are the same (Peasons and Bennett 1974). SEL and SENEL measurements are equivalent to the Leq value of a one-second noise event producing the same cumulative acoustic energy as the actual noise event being analyzed. In effect, an SEL or SENEL measure "spreads" or "compresses" the noise event to fit a fixed one-second time interval. If the actual duration of the noise event is less than one second, the SEL or SENEL value will be less than the Leq value for the event. If the duration of the noise event exceeds one second, the SEL or SENEL value will exceed the Leq of the event.

In practice, the SENEL descriptor implies an A-weighted basis, while SEL descriptors often use other decibel weighting schemes. Impulse noises of substantial magnitude (e.g., blasting or sonic booms) often are characterized using unweighted (flat) or C-weighted SEL measures. Annoyance from such sources often involves induced structural vibrations as well as the loudness of the noise event. Unweighted and C-weighted decibel scales have proven more useful than the A-weighted scale for such evaluations. Less intense impulse noises often are characterized using an A-weighted SEL measure. In recent years, the SEL acronym has tended to replace the SENEL acronym in technical noise reports, regardless of the decibel weighting scheme being used.

Most SEL and SENEL measurements are performed using procedures that restrict the time interval over which actual measurements or subsequent calculations are made. Sometimes this involves defining the noise event as the period when sound levels exceed a particular threshold level. In other cases, the calculations are restricted to that portion of the noise event when sound levels are within a defined increment (generally 10 - 30 dB) of the peak sound level. The measurement restrictions noted above are done as a practical expediency to minimize manual computations, to accommodate monitoring instruments with a limited measurement range, or to systematically define discrete noise events against fluctuating background noise conditions.

If individual noise events are repeated frequently, it is possible to calculate Ldn or CNEL values based on typical SEL or SENEL values and the number and time of occurrence of the noise events. Such computation procedures often are used to evaluate airport noise.

E.2 Noise Impact Calculations For Flyover Events

E.2.1 Available Data

Most data on noise levels from military aircraft are presented as A-weighted SEL values at different slant distances from the flight path of an aircraft flying at low altitude. Noise monitoring is generally done for several power settings and air speeds. The reported SEL values are typically computed for the time interval when noise levels are within 10 dBA of the peak level. Data are available (US Navy 1984) for many, but not all, of the aircraft types used by the Navy. However, E-2 aircraft are not included in the available data compilation.

Although flyover event SEL data are not available for E-2 aircraft, data are available for the similar but larger P-3 aircraft. In terms of noise data, the most important difference between P-3 and E-2 aircraft is the number of engines. The P-3 aircraft has four engines while the E-2 aircraft has two. Both aircraft use the same basic engine type (Taylor, 1993). Thus, SEL data for P-3 aircraft can be used to estimate noise levels from E-2 aircraft.

E.2.2 Technical Approach

While SEL data have their uses, a dBA time history profile provides a more understandable description of flyover event noise. A dBA time history also allows peak noise levels to be estimated and compared to other common noise sources and various impact significance criteria.

Developing dBA time histories from SEL data requires some basic assumptions. A fundamental assumption is that aircraft SEL data provide a robust estimate of total acoustic energy output for basic engine power settings. When that assumption is used, it is possible to synthesize an approximate time history of dBA levels that is consistent with the measured SEL data.

The aircraft flyover event noise level analyses presented in this EIS required several steps: estimating flyover event durations, simulating flyover event time histories for a standardized slant distance, calibrating measured SEL data to a simple distance attenuation model, and estimating peak flyover event dBA at various slant distances.

Event Duration. The synthesis of dBA time histories from SEL data requires an estimate of the duration of the noise event that was measured for the SEL data. The SEL data tables (US Navy, 1984) indicate aircraft power setting, flight speed, and slant distance.

Preliminary analyses assume that aircraft can be heard above background noise from a distance of 2 nautical miles (2.3 statute miles). Flight speed then defines a nominal event duration. When flight speed is a significant fraction of the speed of sound, there will be only a brief time interval for the approach portion of the noise event (2 nautical miles at the speed of sound versus 2 nautical miles at flight

speed). Consequently, the duration of the approach segment of the noise event requires adjustment for the time lag between the speed of sound and the speed of the aircraft. Speed of sound calculations incorporate temperature and relative humidity corrections (Weast 1980).

Flyover profile simulation. The flyover event simulation analysis uses event durations and peak noise levels to create a time history using generalized noise level rise and fall equations. The simulation procedure used for this EIS divides the overall event into 25 intervals. Peak noise conditions are assumed to last for 2 intervals. The placement of the peak intervals depends on approach lag time versus overall event duration.

Noise level changes from background to peak and then back down to background are simulated with simple mathematical formulations. Different types of curves are used for the approach segment depending on the type of aircraft. For turboprop aircraft, a sine curve formulation is use to simulate the approach segment. A logarithmic curve formulation is used to simulate the departure segment of the event.

With the event duration defined and appropriate curve types programmed, the peak dBA value is the only remaining factor needed to fully define the event profile. Peak dBA values are identified by iteration, matching the simulated event SEL to the measured SEL value.

As noted previously, available aircraft SEL data were for the four-engine P-3 aircraft. Once the P-3 aircraft SEL data were simulated as a time history, E-2 aircraft peak dBA values were estimated as being 3 dBA less than the peak dBA for P-3 aircraft. This is consistent with general acoustical theory, in that doubling the number of co-located noise sources increases overall noise levels by 3 dBA.

For any basic power setting (takeoff, cruise, or approach power), the simulation can be repeated at various flight speeds. In each case, the SEL value used for calibration is assumed to be constant for a given power setting, regardless of air speed. Consequently, the only factors that vary are event duration (defined by air speed) and peak dBA (established by iteration and matching of the measured SEL value). Higher air speeds at a given power setting yield shorter event durations with higher peak dBA values.

Distance attenuation calibration. Measured SEL data at various slant distances (US Navy 1984) were also used to calibrate a basic two-factor noise attenuation model. The noise attenuation model calculates noise levels at various distances on the basis of a geometric noise drop-off rate and a linear atmospheric absorption rate. Measured SEL data at various distances were used to estimate basic drop-off rates and atmospheric absorption factors.

Modeled E-2 peak noise level versus distance. The final computation for the flyover event noise analysis applied the calibrated noise attenuation model to estimated peak dBA values for various E-2 power settings and air speeds.

Tables E-1 through E-21 summarize the results of the noise analysis.

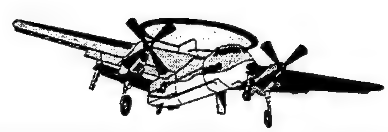
E.3 References

Pearsons, K. S. and R. Bennett. 1974. *Handbook of Noise Ratings.* Prepared for the National Aeronautics and Space Administration. (N74-23275.) National Technical Information Service. Springfield, VA. 326 pp.

Taylor, Michael J. H. (ed.). 1993. *Jane's Encyclopedia of Aviation.* Crescent Books. New York, NY.

US Navy. 1984. *Catalog of Noise Levels from Navy Aircraft.* AESO Report No. 313-01-84. Aircraft Environmental Support Office, Naval Air Station San Diego. San Diego, CA.

Weast, R. C. (ed.) 1980. "Absorption and Velocity of Sound in Still Air" and "Velocity of Sound in Dry Air". Pages E-49 through E-54 in *CRC Handbook of Chemistry and Physics.* 61st Edition. CRC Press. Boca Raton, FL.



Flyover Event Noise Analysis

TABLE E-1. FLYOVER EVENT DURATION CALCULATIONS: SEL TESTS FOR P3 & E2 AIRCRAFT

AIRCRAFT SPEED:	125 KNOTS =	144 MPH	18.7% of speed of sound
TYPICAL AIR TEMPERATURE:	70 DEGREES F	TAKEOFF POWER	
TYPICAL RELATIVE HUMIDITY:	60%		

EVENT COMPONENT	APPROACH SEGMENT DISTANCE 1 NM	1.5 NM	2 NM	3 NM	4 NM
APPROACH LAG TIME (SECONDS), AIRCRAFT VS SOUND:	23.4	35.1	46.9	70.3	93.7
FLYOVER EVENT DURATION (SEC), 1 NM DEPARTURE:	52.2	63.9	75.7	99.1	122.5
FLYOVER EVENT DURATION (SEC), 1.5 NM DEPARTURE:	66.6	78.3	90.1	113.5	136.9
FLYOVER EVENT DURATION (SEC), 2 NM DEPARTURE:	81.0	92.7	104.5	127.9	151.3
FLYOVER EVENT DURATION (SEC), 3 NM DEPARTURE:	109.8	121.5	133.3	156.7	180.1
FLYOVER EVENT DURATION (SEC), 4 NM DEPARTURE:	138.6	150.3	162.1	185.5	208.9

AIRCRAFT SPEED & SEL DURATION REFERENCE POINTS:

	KNOTS	MPH	FT/SEC	SEC/MI	SEC/NM (1 NM)	S/1.5NM (1.5 NM)	SEC/2 NM (2 NM)	SEC/3 NM (3 NM)	SEC/4 NM (4 NM)
	125	143.8	211.0	25.0	28.8	43.2	57.6	86.4	115.2
ESTIMATED SPEED OF SOUND:	670.0	771.0	1130.8	4.7	5.4	8.1	10.7	16.1	21.5

NM = nautical miles

speed of sound (ft/sec) = [(deg R)^0.5]*49.042 + RH correction increment

deg R = 459.67+deg F

1.150779448 knots ==> mph

relative humidity corrections (68 F):

RH:	FT/SEC:	RH:	FT/SEC:
0%	0.00	50%	1.72
5%	0.03	55%	1.92
10%	0.19	60%	2.12
15%	0.36	65%	2.33
20%	0.54	70%	2.53
25%	0.73	75%	2.73
30%	0.92	80%	2.94
35%	1.12	85%	3.15
40%	1.31	90%	3.35
45%	1.51	95%	3.56
50%	1.72	100%	3.76

TABLE E-2. FLYOVER EVENT DURATION CALCULATIONS: SEL TESTS FOR P3 & E2 AIRCRAFT

AIRCRAFT SPEED:	150 KNOTS =	173 MPH	22.4% of speed of sound
TYPICAL AIR TEMPERATURE:	70 DEGREES F	TAKEOFF POWER	
TYPICAL RELATIVE HUMIDITY:	60%		

EVENT COMPONENT	APPROACH SEGMENT DISTANCE 1 NM	1.5 NM	2 NM	3 NM	4 NM
APPROACH LAG TIME (SECONDS), AIRCRAFT VS SOUND:	18.6	27.9	37.3	55.9	74.5
FLYOVER EVENT DURATION (SEC), 1 NM DEPARTURE:	42.6	51.9	61.3	79.9	98.5
FLYOVER EVENT DURATION (SEC), 1.5 NM DEPARTURE:	54.6	63.9	73.3	91.9	110.5
FLYOVER EVENT DURATION (SEC), 2 NM DEPARTURE:	66.6	75.9	85.3	103.9	122.5
FLYOVER EVENT DURATION (SEC), 3 NM DEPARTURE:	90.6	99.9	109.3	127.9	146.5
FLYOVER EVENT DURATION (SEC), 4 NM DEPARTURE:	114.6	123.9	133.3	151.9	170.5

AIRCRAFT SPEED & SEL DURATION REFERENCE POINTS: 1 NM 1.5 NM 2 NM 3 NM 4 NM

	KNOTS	MPH	FT/SEC	SEC/MI	SEC/NM	S/1.5NM	SEC/2 NM	SEC/3 NM	SEC/4 NM
	150	172.6	253.2	20.9	24.0	36.0	48.0	72.0	96.0
ESTIMATED SPEED OF SOUND:	670.0	771.0	1130.8	4.7	5.4	8.1	10.7	16.1	21.5

NM = nautical miles

speed of sound (ft/sec) = [(deg R)^0.5]*49.042 + RH correction increment

deg R = 459.67+deg F

1.150779448 knots ==> mph

relative humidity corrections (68 F):

RH:	FT/SEC:	RH:	FT/SEC:
0%	0.00	50%	1.72
5%	0.03	55%	1.92
10%	0.19	60%	2.12
15%	0.36	65%	2.33
20%	0.54	70%	2.53
25%	0.73	75%	2.73
30%	0.92	80%	2.94
35%	1.12	85%	3.15
40%	1.31	90%	3.35
45%	1.51	95%	3.56
50%	1.72	100%	3.76

TABLE E-3. FLYOVER EVENT DURATION CALCULATIONS: SEL TESTS FOR P3 & E2 AIRCRAFT

AIRCRAFT SPEED:	160 KNOTS =	184 MPH	23.9% of speed of sound
TYPICAL AIR TEMPERATURE:	70 DEGREES F	CRUISE POWER	
TYPICAL RELATIVE HUMIDITY:	60%		

EVENT COMPONENT	APPROACH SEGMENT DISTANCE 1 NM	1.5 NM	2 NM	3 NM	4 NM
APPROACH LAG TIME (SECONDS), AIRCRAFT VS SOUND:	17.1	25.7	34.3	51.4	68.5
FLYOVER EVENT DURATION (SEC), 1 NM DEPARTURE:	39.6	48.2	56.8	73.9	91.0
FLYOVER EVENT DURATION (SEC), 1.5 NM DEPARTURE:	50.9	59.4	68.0	85.1	102.3
FLYOVER EVENT DURATION (SEC), 2 NM DEPARTURE:	62.1	70.7	79.3	96.4	113.5
FLYOVER EVENT DURATION (SEC), 3 NM DEPARTURE:	84.6	93.2	101.8	118.9	136.0
FLYOVER EVENT DURATION (SEC), 4 NM DEPARTURE:	107.1	115.7	124.3	141.4	158.5

AIRCRAFT SPEED & SEL DURATION REFERENCE POINTS:

	KNOTS	MPH	FT/SEC	SEC/MI	SEC/NM (1 NM)	S/1.5NM (1.5 NM)	SEC/2 NM (2 NM)	SEC/3 NM (3 NM)	SEC/4 NM (4 NM)
	160	184.1	270.0	19.6	22.5	33.8	45.0	67.5	90.0
ESTIMATED SPEED OF SOUND:	670.0	771.0	1130.8	4.7	5.4	8.1	10.7	16.1	21.5

NM = nautical miles
speed of sound (ft/sec) = [(deg R)^0.5]*49.042 + RH correction increment

deg R = 459.67+deg F
1.150779448 knots ==> mph

relative humidity corrections (68 F):

RH:	FT/SEC:	RH:	FT/SEC:
0%	0.00	50%	1.72
5%	0.03	55%	1.92
10%	0.19	60%	2.12
15%	0.36	65%	2.33
20%	0.54	70%	2.53
25%	0.73	75%	2.73
30%	0.92	80%	2.94
35%	1.12	85%	3.15
40%	1.31	90%	3.35
45%	1.51	95%	3.56
50%	1.72	100%	3.76

TABLE E-4. FLYOVER EVENT DURATION CALCULATIONS: SEL TESTS FOR P3 & E2 AIRCRAFT

AIRCRAFT SPEED:	200 KNOTS =	230 MPH	29.9% of speed of sound
TYPICAL AIR TEMPERATURE:	70 DEGREES F	CRUISE POWER	
TYPICAL RELATIVE HUMIDITY:	60%		

EVENT COMPONENT	APPROACH SEGMENT DISTANCE 1 NM	1.5 NM	2 NM	3 NM	4 NM
APPROACH LAG TIME (SECONDS), AIRCRAFT VS SOUND:	12.6	18.9	25.3	37.9	50.5
FLYOVER EVENT DURATION (SEC), 1 NM DEPARTURE:	30.6	36.9	43.3	55.9	68.5
FLYOVER EVENT DURATION (SEC), 1.5 NM DEPARTURE:	39.6	45.9	52.3	64.9	77.5
FLYOVER EVENT DURATION (SEC), 2 NM DEPARTURE:	48.6	54.9	61.3	73.9	86.5
FLYOVER EVENT DURATION (SEC), 3 NM DEPARTURE:	66.6	72.9	79.3	91.9	104.5
FLYOVER EVENT DURATION (SEC), 4 NM DEPARTURE:	84.6	90.9	97.3	109.9	122.5

AIRCRAFT SPEED & SEL DURATION REFERENCE POINTS: 1 NM 1.5 NM 2 NM 3 NM 4 NM

	KNOTS	MPH	FT/SEC	SEC/MI	SEC/NM	S/1.5NM	SEC/2 NM	SEC/3 NM	SEC/4 NM
	200	230.2	337.6	15.6	18.0	27.0	36.0	54.0	72.0
ESTIMATED SPEED OF SOUND:	670.0	771.0	1130.8	4.7	5.4	8.1	10.7	16.1	21.5

NM = nautical miles
speed of sound (ft/sec) = [(deg R)^0.5]*49.042 + RH correction increment

deg R = 459.67+deg F
1.150779448 knots ==> mph

relative humidity corrections (68 F):

RH:	FT/SEC:	RH:	FT/SEC:
0%	0.00	50%	1.72
5%	0.03	55%	1.92
10%	0.19	60%	2.12
15%	0.36	65%	2.33
20%	0.54	70%	2.53
25%	0.73	75%	2.73
30%	0.92	80%	2.94
35%	1.12	85%	3.15
40%	1.31	90%	3.35
45%	1.51	95%	3.56
50%	1.72	100%	3.76

TABLE E-5. FLYOVER EVENT DURATION CALCULATIONS: SEL TESTS FOR P3 & E2 AIRCRAFT

AIRCRAFT SPEED:	120 KNOTS =	138 MPH	17.9% of speed of sound
TYPICAL AIR TEMPERATURE:	70 DEGREES F	APPROACH POWER	
TYPICAL RELATIVE HUMIDITY:	60%		

EVENT COMPONENT	APPROACH SEGMENT DISTANCE 1 NM	1.5 NM	2 NM	3 NM	4 NM
APPROACH LAG TIME (SECONDS), AIRCRAFT VS SOUND:	24.6	36.9	49.3	73.9	98.5
FLYOVER EVENT DURATION (SEC), 1 NM DEPARTURE:	54.6	66.9	79.3	103.9	128.5
FLYOVER EVENT DURATION (SEC), 1.5 NM DEPARTURE:	69.6	81.9	94.3	118.9	143.5
FLYOVER EVENT DURATION (SEC), 2 NM DEPARTURE:	84.6	96.9	109.3	133.9	158.5
FLYOVER EVENT DURATION (SEC), 3 NM DEPARTURE:	114.6	126.9	139.3	163.9	188.5
FLYOVER EVENT DURATION (SEC), 4 NM DEPARTURE:	144.6	156.9	169.3	193.9	218.5

AIRCRAFT SPEED & SEL DURATION REFERENCE POINTS: 1 NM, 1.5 NM, 2 NM, 3 NM, 4 NM

KNOTS	MPH	FT/SEC	SEC/MI	SEC/NM	S/1.5NM	SEC/2 NM	SEC/3 NM	SEC/4 NM
120	138.1	202.5	26.1	30.0	45.0	60.0	90.0	120.0
ESTIMATED SPEED OF SOUND:								
670.0	771.0	1130.8	4.7	5.4	8.1	10.7	16.1	21.5

NM = nautical miles

speed of sound (ft/sec) = [(deg R)^0.5]*49.042 + RH correction increment

deg R = 459.67+deg F

1.150779448 knots ==> mph

relative humidity corrections (68 F):

RH:	FT/SEC:	RH:	FT/SEC:
0%	0.00	50%	1.72
5%	0.03	55%	1.92
10%	0.19	60%	2.12
15%	0.36	65%	2.33
20%	0.54	70%	2.53
25%	0.73	75%	2.73
30%	0.92	80%	2.94
35%	1.12	85%	3.15
40%	1.31	90%	3.35
45%	1.51	95%	3.56
50%	1.72	100%	3.76

TABLE E-6. FLYOVER EVENT DURATION CALCULATIONS: SEL TESTS FOR P3 & E2 AIRCRAFT

AIRCRAFT SPEED:	130 KNOTS =	150 MPH	19.4% of speed of sound
TYPICAL AIR TEMPERATURE:	70 DEGREES F	APPROACH POWER	
TYPICAL RELATIVE HUMIDITY:	60%		

EVENT COMPONENT	APPROACH SEGMENT DISTANCE 1 NM	1.5 NM	2 NM	3 NM	4 NM
APPROACH LAG TIME (SECONDS), AIRCRAFT VS SOUND:	22.3	33.5	44.6	67.0	89.3
FLYOVER EVENT DURATION (SEC), 1 NM DEPARTURE:	50.0	61.2	72.3	94.6	117.0
FLYOVER EVENT DURATION (SEC), 1.5 NM DEPARTURE:	63.9	75.0	86.2	108.5	130.8
FLYOVER EVENT DURATION (SEC), 2 NM DEPARTURE:	77.7	88.9	100.0	122.3	144.7
FLYOVER EVENT DURATION (SEC), 3 NM DEPARTURE:	105.4	116.6	127.7	150.0	172.4
FLYOVER EVENT DURATION (SEC), 4 NM DEPARTURE:	133.1	144.2	155.4	177.7	200.0

AIRCRAFT SPEED & SEL DURATION REFERENCE POINTS: 1 NM 1.5 NM 2 NM 3 NM 4 NM

KNOTS	MPH	FT/SEC	SEC/MI	SEC/NM	S/1.5NM	SEC/2 NM	SEC/3 NM	SEC/4 NM
130	149.6	219.4	24.1	27.7	41.5	55.4	83.1	110.8
ESTIMATED SPEED OF SOUND:								
670.0	771.0	1130.8	4.7	5.4	8.1	10.7	16.1	21.5

NM = nautical miles

speed of sound (ft/sec) = [(deg R)^0.5]*49.042 + RH correction increment

deg R = 459.67+deg F

1.150779448 knots ==> mph

relative humidity corrections (68 F):

RH:	FT/SEC:	RH:	FT/SEC:
0%	0.00	50%	1.72
5%	0.03	55%	1.92
10%	0.19	60%	2.12
15%	0.36	65%	2.33
20%	0.54	70%	2.53
25%	0.73	75%	2.73
30%	0.92	80%	2.94
35%	1.12	85%	3.15
40%	1.31	90%	3.35
45%	1.51	95%	3.56
50%	1.72	100%	3.76

TABLE E-7. FLYOVER SIMULATION, E-2 TAKEOFF POWER AT 300 FEET AND 125 KNOTS

INPUT==>	PEAK dB =	84.54 dBA	315	FT SLANT DIST.
INPUT==>	EVENT DURATION =	104.50 seconds	144	MPH
INPUT==>	BACKGROUND dB =	50.00 dBA	125	KNOTS

ESTIMATED DECIBEL LEVEL	CALCS	DATA POINT SEQUENCE	INCREMENTAL dB CHANGE	INTERVAL COUNT	EVENT TIME (SECONDS)
50.00	100000	1	0.00	0	0.0
54.92	310138	2	4.92	1	4.2
59.73	939949	3	4.82	2	8.4
64.35	2721720	4	4.62	3	12.5
68.67	7368403	5	4.33	4	16.7
72.62	18276329	6	3.95	5	20.9
76.10	40771720	7	3.48	6	25.1
79.06	80480321	8	2.95	7	29.3
81.42	138633731	9	2.36	8	33.4
83.14	206105096	10	1.72	9	37.6
84.19	262327162	11	1.05	10	41.8
84.54	284446111	12	0.35	11	46.0
84.54	284446111	13	0.00	12	50.2
84.54	284446111	14	0.00	13	54.3
83.37	217296907	15	-1.17	14	58.5
82.10	162260560	16	-1.27	15	62.7
80.72	117936458	17	-1.39	16	66.9
79.19	82979083	18	-1.53	17	71.1
77.49	56100868	19	-1.70	18	75.2
75.57	36075531	20	-1.92	19	79.4
73.37	21742012	21	-2.20	20	83.6
70.80	12009231	22	-2.58	21	87.8
67.68	5861991	23	-3.11	22	92.0
63.74	2368562	24	-3.94	23	96.1
58.39	690961	25	-5.35	24	100.3
50.00	100000	26	-8.39	25	104.5

SEL =	99.71	dBA	P-3 DATA: SEL delta10 = 102.6 dBA
Leq(event) =	79.52	dBA	at 125 knots, P-3 L(max) = 87.54 dBA
L(max) =	84.54	dBA	E-2 = P-3 L(max) - 3 dBA
PEAK - SEL =	-15.17	dBA	
PEAK - Leq =	5.02	dBA	SIN CURVE RISE
SEL - Leq =	20.19	dBA	LOG CURVE DECAY
SEL delta10 =	99.74	dBA	

TABLE E-8. FLYOVER SIMULATION, E-2 TAKEOFF POWER AT 300 FEET AND 150 KNOTS

INPUT==>	PEAK dB =	85.47 dBA	315	FT SLANT DIST.
INPUT==>	EVENT DURATION =	85.30 seconds	173	MPH
INPUT==>	BACKGROUND dB =	50.00 dBA	150	KNOTS

ESTIMATED DECIBEL LEVEL	CALCS	DATA POINT SEQUENCE	INCREMENTAL dB CHANGE	INTERVAL COUNT	EVENT TIME (SECONDS)
50.00	100000	1	0.00	0	0.0
55.05	319735	2	5.05	1	3.4
59.99	998402	3	4.95	2	6.8
64.73	2974932	4	4.74	3	10.2
69.18	8272809	5	4.44	4	13.6
73.23	21027664	6	4.05	5	17.1
76.81	47934008	7	3.58	6	20.5
79.84	96366543	8	3.03	7	23.9
82.26	168447546	9	2.43	8	27.3
84.03	253117153	10	1.77	9	30.7
85.11	324262446	11	1.08	10	34.1
85.47	352370871	12	0.36	11	37.5
85.47	352370871	13	0.00	12	40.9
85.47	352370871	14	0.00	13	44.4
84.27	267242008	15	-1.20	14	47.8
82.97	197992587	16	-1.30	15	51.2
81.54	142676727	17	-1.42	16	54.6
79.98	99440374	18	-1.57	17	58.0
78.23	66525236	19	-1.75	18	61.4
76.26	42273330	20	-1.97	19	64.8
74.00	25132300	21	-2.26	20	68.2
71.36	13661764	22	-2.65	21	71.7
68.16	6541092	23	-3.20	22	75.1
64.11	2579249	24	-4.04	23	78.5
58.62	727874	25	-5.49	24	81.9
50.00	100000	26	-8.62	25	85.3

SEL =	99.70	dBA
Leq(event) =	80.39	dBA
L(max) =	85.47	dBA
PEAK - SEL =	-14.23	dBA
PEAK - Leq =	5.08	dBA
SEL - Leq =	19.31	dBA
SEL delta10 =	99.74	dBA

P-3 DATA: SEL delta10 = 102.6 dBA
at 150 knots, P-3 L(max) = 88.47 dBA
E-2 = P-3 L(max) - 3 dBA

SIN CURVE	RISE
LOG CURVE	DECAY

TABLE E-9. FLYOVER SIMULATION, E-2 CRUISE POWER AT 300 FEET AND 160 KNOTS

INPUT==>	PEAK dB =	84.94 dBA	315	FT SLANT DIST.
INPUT==>	EVENT DURATION =	79.30 seconds	184	MPH
INPUT==>	BACKGROUND dB =	50.00 dBA	160	KNOTS

ESTIMATED DECIBEL LEVEL	CALCS	DATA POINT SEQUENCE	INCREMENTAL dB CHANGE	INTERVAL COUNT	EVENT TIME (SECONDS)
50.00	100000	1	0.00	0	0.0
55.47	352032	2	5.47	1	3.2
60.80	1201449	3	5.33	2	6.3
65.86	3856939	4	5.07	3	9.5
70.54	11316749	5	4.67	4	12.7
74.71	29555009	6	4.17	5	15.9
78.27	67097352	7	3.56	6	19.0
81.13	129770744	8	2.86	7	22.2
83.23	210373711	9	2.10	8	25.4
84.51	282476980	10	1.28	9	28.5
84.94	311888958	11	0.43	10	31.7
84.94	311888958	12	0.00	11	34.9
84.94	311888958	13	0.00	12	38.1
83.85	242735899	14	-1.09	13	41.2
82.68	185289026	15	-1.17	14	44.4
81.41	138272301	16	-1.27	15	47.6
80.02	100459416	17	-1.39	16	50.8
78.49	70675950	18	-1.53	17	53.9
76.79	47801841	19	-1.70	18	57.1
74.88	30774237	20	-1.91	19	60.3
72.69	18590854	21	-2.19	20	63.4
70.13	10313998	22	-2.56	21	66.6
67.05	5075508	23	-3.08	22	69.8
63.19	2083050	24	-3.87	23	73.0
57.98	628502	25	-5.20	24	76.1
50.00	100000	26	-7.98	25	79.3

SEL =	98.86	dBA	P-3 DATA:	SEL delta10 = 101.7 dBA
Leq(event) =	79.87	dBA	at 160 knots, P-3 L(max) = 87.94 dBA	
L(max) =	84.94	dBA	E-2 = P-3 L(max) - 3 dBA	
PEAK - SEL =	-13.92	dBA		
PEAK - Leq =	5.07	dBA	SIN CURVE	RISE
SEL - Leq =	18.99	dBA	LOG CURVE	DECAY
SEL delta10 =	98.83	dBA		

TABLE E-10. FLYOVER SIMULATION, E-2 CRUISE POWER AT 300 FEET AND 200 KNOTS

INPUT==>	PEAK dB =	86.11 dBA	315	FT SLANT DIST.
INPUT==>	EVENT DURATION =	61.30 seconds	230	MPH
INPUT==>	BACKGROUND dB =	50.00 dBA	200	KNOTS

ESTIMATED DECIBEL LEVEL	CALCS	DATA POINT SEQUENCE	INCREMENTAL dB CHANGE	INTERVAL COUNT	EVENT TIME (SECONDS)
50.00	100000	1	0.00	0	0.0
55.65	367185	2	5.65	1	2.5
61.16	1305751	3	5.51	2	4.9
66.39	4358727	4	5.23	3	7.4
71.22	13258444	5	4.83	4	9.8
75.53	35757125	6	4.31	5	12.3
79.21	83437324	7	3.68	6	14.7
82.17	164977439	8	2.96	7	17.2
84.34	271809781	9	2.17	8	19.6
85.67	368589193	10	1.32	9	22.1
86.11	408319386	11	0.44	10	24.5
86.11	408319386	12	0.00	11	27.0
86.11	408319386	13	0.00	12	29.4
84.98	315129113	14	-1.13	13	31.9
83.77	238383853	15	-1.21	14	34.3
82.46	176159380	16	-1.31	15	36.8
81.03	126623768	17	-1.43	16	39.2
79.45	88040458	18	-1.58	17	41.7
77.69	58771725	19	-1.76	18	44.1
75.72	37282641	20	-1.98	19	46.6
73.45	22145681	21	-2.26	20	49.0
70.81	12046159	22	-2.64	21	51.5
67.63	5788809	23	-3.18	22	53.9
63.63	2305991	24	-4.00	23	56.4
58.25	668404	25	-5.38	24	58.8
50.00	100000	26	-8.25	25	61.3

SEL =	98.85	dBA	P-3 DATA:	SEL delta10 = 101.7 dBA
Leq(event) =	80.97	dBA	at 200 knots, P-3 L(max) = 89.11 dBA	
L(max) =	86.11	dBA	E-2 = P-3 L(max) - 3 dBA	
PEAK - SEL =	-12.74	dBA		
PEAK - Leq =	5.14	dBA	SIN CURVE	RISE
SEL - Leq =	17.87	dBA	LOG CURVE	DECAY
SEL delta10 =	98.83	dBA		

TABLE E-11. FLYOVER SIMULATION, E-2 APPROACH POWER AT 300 FEET AND 120 KNOTS

INPUT==>	PEAK dB =	75.95 dBA	315	FT SLANT DIST.
INPUT==>	EVENT DURATION =	109.30 seconds	138	MPH
INPUT==>	BACKGROUND dB =	50.00 dBA	120	KNOTS

ESTIMATED DECIBEL LEVEL	CALCS	DATA POINT SEQUENCE	INCREMENTAL dB CHANGE	INTERVAL COUNT	EVENT TIME (SECONDS)
50.00	100000	1	0.00	0	0.0
53.69	234049	2	3.69	1	4.4
57.31	538389	3	3.62	2	8.7
60.78	1196746	4	3.47	3	13.1
64.03	2529082	5	3.25	4	17.5
66.99	5004534	6	2.96	5	21.9
69.61	9144714	7	2.62	6	26.2
71.83	15242385	8	2.22	7	30.6
73.60	22934804	9	1.77	8	35.0
74.90	30894720	10	1.29	9	39.3
75.69	37032808	11	0.79	10	43.7
75.95	39355008	12	0.26	11	48.1
75.95	39355008	13	0.00	12	52.5
75.95	39355008	14	0.00	13	56.8
75.07	32146804	15	-0.88	14	61.2
74.12	25813216	16	-0.95	15	65.6
73.08	20311309	17	-1.04	16	70.0
71.93	15596581	18	-1.15	17	74.3
70.65	11622743	19	-1.28	18	78.7
69.21	8341443	20	-1.44	19	83.1
67.56	5701904	21	-1.65	20	87.4
65.62	3650444	22	-1.94	21	91.8
63.28	2129793	23	-2.34	22	96.2
60.33	1078088	24	-2.96	23	100.6
56.31	427252	25	-4.02	24	104.9
50.00	100000	26	-6.31	25	109.3

SEL =	91.92	dBA	P-3 DATA:	SEL delta10 = 94.7 dBA
Leq(event) =	71.53	dBA	at 120 knots,	P-3 L(max) = 78.95 dBA
L(max) =	75.95	dBA	E-2 = P-3 L(max) - 3 dBA	
PEAK - SEL =	-15.97	dBA		
PEAK - Leq =	4.42	dBA	SIN CURVE	RISE
SEL - Leq =	20.39	dBA	LOG CURVE	DECAY
SEL delta10 =	91.88	dBA		

TABLE E-12. FLYOVER SIMULATION, E-2 APPROACH POWER AT 300 FEET AND 130 KNOTS

INPUT==>	PEAK dB =	76.36 dBA	315	FT SLANT DIST.
INPUT==>	EVENT DURATION =	100.00 seconds	150	MPH
INPUT==>	BACKGROUND dB =	50.00 dBA	130	KNOTS

ESTIMATED DECIBEL LEVEL	CALCS	DATA POINT SEQUENCE	INCREMENTAL dB CHANGE	INTERVAL COUNT	EVENT TIME (SECONDS)
50.00	100000	1	0.00	0	0.0
53.75	237215	2	3.75	1	4.0
57.43	552901	3	3.68	2	8.0
60.95	1244612	4	3.52	3	12.0
64.25	2661517	5	3.30	4	16.0
67.26	5323692	6	3.01	5	20.0
69.92	9821004	7	2.66	6	24.0
72.18	16502294	8	2.25	7	28.0
73.98	24991363	9	1.80	8	32.0
75.29	33823884	10	1.31	9	36.0
76.09	40660182	11	0.80	10	40.0
76.36	43251383	12	0.27	11	44.0
76.36	43251383	13	0.00	12	48.0
76.36	43251383	14	0.00	13	52.0
75.47	35216777	15	-0.89	14	56.0
74.50	28180474	16	-0.97	15	60.0
73.44	22090182	17	-1.06	16	64.0
72.28	16891897	18	-1.17	17	68.0
70.98	12529673	19	-1.30	18	72.0
69.52	8945323	20	-1.46	19	76.0
67.84	6078051	21	-1.68	20	80.0
65.87	3863938	22	-1.97	21	84.0
63.49	2235242	23	-2.38	22	88.0
60.49	1119360	24	-3.00	23	92.0
56.41	437168	25	-4.08	24	96.0
50.00	100000	26	-6.41	25	100.0

SEL =	91.91	dBA	P-3 DATA:	SEL delta10 = 94.7 dBA
Leq(event) =	71.91	dBA	at 130 knots,	P-3 L(max) = 79.36 dBA
L(max) =	76.36	dBA	E-2 = P-3 L(max) - 3 dBA	
PEAK - SEL =	-15.55	dBA		
PEAK - Leq =	4.45	dBA	SIN CURVE	RISE
SEL - Leq =	20.00	dBA	LOG CURVE	DECAY
SEL delta10 =	91.88	dBA		

TABLE E-13. DISTANCE CALIBRATION FOR P-3 SEL DATA, TAKEOFF POWER

==> Basic sound level drop-off rate: 5.25 dB/doubling
==> Atmospheric absorption coefficient: 0.08 dB/100 meters
==> Reference Noise Level: 102.6 SEL (dBA)
==> Distance for Reference Noise Level: 315 Feet
deviation 200-8,000 ft: 1.33
deviation 10,000-25,000 ft: -0.06

DISTANCE ATTENUATION:

Receptor Distance (feet)	Noise Level (dBA) at Receptor	Target SEL
200	106.1	105.8
250	104.4	104.2
315	102.6	102.6
400	100.8	100.9
500	99.1	99.2
630	97.3	97.4
800	95.4	95.6
1,000	93.7	93.8
1,250	91.9	91.9
1,600	90.0	90.0
2,000	88.2	88.1
2,500	86.4	86.2
3,150	84.5	84.2
4,000	82.5	82.3
5,000	80.5	80.0
6,300	78.5	78.2
8,000	76.2	76.1
10,000	74.0	73.9
12,500	71.7	71.6
16,000	69.0	69.1
20,000	66.4	66.5
25,000	63.5	63.6

DISTANCE TO dB CONTOURS:

Noise Contour Value (dBA)	Contour Distance (feet)
105	230
100	442
95	843
90	1,596
85	2,996
80	5,211
75	8,650
70	29,455
65	50,038
60	70,578
55	91,104
50	95,655
45	100,433
40	105,450
35	110,718
30	116,249
25	121,936

TABLE E-14. DISTANCE CALIBRATION FOR P-3 SEL DATA, CRUISE POWER

==> Basic sound level drop-off rate: 5.4 dB/doubling
==> Atmospheric absorption coefficient: 0.11 dB/100 meters
==> Reference Noise Level: 101.7 SEL (dBA)
==> Distance for Reference Noise Level: 315 Feet

deviation 200-8,000 ft: 2.46
deviation 10,000-25,000 ft: 0.80

DISTANCE ATTENUATION:

Receptor Distance (feet)	Noise Level (dBA) at Receptor	Target SEL
200	105.3	104.9
250	103.5	103.3
315	101.7	101.7
400	99.8	100.0
500	98.0	98.3
630	96.2	96.5
800	94.3	94.6
1,000	92.5	92.7
1,250	90.6	90.8
1,600	88.6	88.7
2,000	86.7	86.7
2,500	84.8	84.2
3,150	82.8	82.4
4,000	80.7	80.2
5,000	78.6	78.0
6,300	76.4	75.7
8,000	73.9	73.3
10,000	71.5	70.9
12,500	68.9	68.4
16,000	65.8	65.7
20,000	62.8	62.8
25,000	59.3	59.8

DISTANCE TO dB CONTOURS:

Noise Contour Value (dBA)	Contour Distance (feet)
105	207
100	391
95	735
90	1,342
85	2,461
80	4,207
75	7,559
70	22,315
65	37,179
60	52,068
55	66,967
50	70,207
45	73,603
40	77,164
35	80,896
30	84,810
25	88,808

TABLE E-15. DISTANCE CALIBRATION FOR P-3 SEL DATA, APPROACH POWER

==> Basic sound level drop-off rate: 4.89 dB/doubling
==> Atmospheric absorption coefficient: 0.06 dB/100 meters
==> Reference Noise Level: 94.7 SEL (dBA)
==> Distance for Reference Noise Level: 315 Feet
deviation 200-8,000 ft: -0.55
deviation 10,000-25,000 ft: 2.00

DISTANCE ATTENUATION:

Receptor Distance (feet)	Noise Level (dBA) at Receptor	Target SEL
200	97.9	97.7
250	96.3	96.2
315	94.7	94.7
400	93.0	93.1
500	91.4	91.5
630	89.8	89.9
800	88.0	88.3
1,000	86.4	86.7
1,250	84.8	85.0
1,600	83.0	83.3
2,000	81.4	81.5
2,500	79.7	79.8
3,150	77.9	77.9
4,000	76.1	76.1
5,000	74.3	74.2
6,300	72.5	72.2
8,000	70.5	70.2
10,000	68.5	68.2
12,500	66.5	66.1
16,000	64.1	63.8
20,000	61.8	61.4
25,000	59.3	58.8

DISTANCE TO dB CONTOURS:

Noise Contour Value (dBA)	Contour Distance (feet)
105	74
100	149
95	302
90	609
85	1,219
80	2,412
75	4,703
70	8,294
65	35,825
60	63,209
55	90,569
50	117,920
45	123,965
40	130,320
35	137,000
30	144,023
25	151,310

TABLE E-16. MODELED NOISE LEVELS: E-2, TAKEOFF AT 125 KNOTS

==> Basic sound level drop-off rate: 5.25 dB/doubling
==> Atmospheric absorption coefficient: 0.08 dB/100 meters
==> Reference Level (SEL, Lmax, Leq): 84.54 Lmax dBA
==> Distance for Reference Noise Level: 315 Feet

DISTANCE ATTENUATION:

Receptor Distance (feet)	Lmax Value (dBA) at Receptor
50	98.5
100	93.3
300	84.9
361	83.5
539	80.4
583	79.8
707	78.3
808	77.3
901	76.4
1,020	75.5
1,513	72.4
2,002	70.1
2,502	68.3
3,002	66.8
5,000	62.5
7,500	58.8
10,560	55.4

DISTANCE TO dB CONTOURS:

Lmax Noise Contour Value (dBA)	Contour Distance (feet)
105	21
100	41
95	80
90	154
85	297
80	569
75	1,079
70	2,028
65	3,571
60	6,920
55	10,815
50	31,407
45	51,938
40	72,456
35	92,968
30	97,490
25	102,200

TABLE E-17. MODELED NOISE LEVELS: E-2, TAKEOFF AT 150 KNOTS

==> Basic sound level drop-off rate: 5.25 dB/doubling
==> Atmospheric absorption coefficient: 0.08 dB/100 meters
==> Reference Level (SEL, Lmax, Leq): 85.47 Lmax dBA
==> Distance for Reference Noise Level: 315 Feet

DISTANCE ATTENUATION:

Receptor Distance (feet)	Lmax Value (dBA) at Receptor
50	99.5
100	94.2
300	85.8
361	84.4
539	81.3
583	80.7
707	79.3
808	78.2
901	77.4
1,020	76.4
1,513	73.3
2,002	71.1
2,502	69.2
3,002	67.7
5,000	63.4
7,500	59.7
10,560	56.4

DISTANCE TO dB CONTOURS:

Lmax Noise Contour Value (dBA)	Contour Distance (feet)
105	24
100	47
95	90
90	174
85	335
80	641
75	1,207
70	2,317
65	4,397
60	7,357
55	11,375
50	32,143
45	52,725
40	73,267
35	93,793
30	98,355
25	103,104

TABLE E-18. MODELED NOISE LEVELS: E-2, CRUISE AT 160 KNOTS

==> Basic sound level drop-off rate: 5.40 dB/doubling
==> Atmospheric absorption coefficient: 0.11 dB/100 meters
==> Reference Level (SEL, Lmax, Leq): 84.94 Lmax dBA
==> Distance for Reference Noise Level: 315 Feet

DISTANCE ATTENUATION:

Receptor Distance (feet)	Lmax Value (dBA) at Receptor
50	99.4
100	94.0
300	85.3
361	83.9
539	80.7
583	80.1
707	78.5
808	77.4
901	76.6
1,020	75.5
1,513	72.3
2,002	70.0
2,502	68.1
3,002	66.5
5,000	61.8
7,500	57.8
10,560	54.1

DISTANCE TO dB CONTOURS:

Lmax Noise Contour Value (dBA)	Contour Distance (feet)
105	24
100	46
95	87
90	166
85	313
80	587
75	1,086
70	1,996
65	3,405
60	5,668
55	10,169
50	24,986
45	39,866
40	54,762
35	69,664
30	72,917
25	76,295

TABLE E-19. MODELED NOISE LEVELS: E-2, CRUISE AT 200 KNOTS

==> Basic sound level drop-off rate: 5.40 dB/doubling
==> Atmospheric absorption coefficient: 0.11 dB/100 meters
==> Reference Level (SEL, Lmax, Leq): 86.11 Lmax dBA
==> Distance for Reference Noise Level: 315 Feet

DISTANCE ATTENUATION:

Receptor Distance (feet)	Lmax Value (dBA) at Receptor
50	100.5
100	95.1
300	86.5
361	85.0
539	81.9
583	81.2
707	79.7
808	78.6
901	77.7
1,020	76.7
1,513	73.5
2,002	71.1
2,502	69.2
3,002	67.6
5,000	63.0
7,500	59.0
10,560	55.3

DISTANCE TO dB CONTOURS:

Lmax Noise Contour Value (dBA)	Contour Distance (feet)
105	28
100	54
95	102
90	191
85	363
80	680
75	1,290
70	2,333
65	4,361
60	7,102
55	10,706
50	25,653
45	40,577
40	55,496
35	70,412
30	73,700
25	77,111

TABLE E-20. MODELED NOISE LEVELS: E-2, APPROACH AT 120 KNOTS

==> Basic sound level drop-off rate: 4.89 dB/doubling
==> Atmospheric absorption coefficient: 0.06 dB/100 meters
==> Reference Level (SEL, Lmax, Leq): 75.95 Lmax dBA
==> Distance for Reference Noise Level: 315 Feet

DISTANCE ATTENUATION:

Receptor Distance (feet)	Lmax Value (dBA) at Receptor
50	89.0
100	84.1
300	76.3
361	75.0
539	72.1
583	71.6
707	70.2
808	69.2
901	68.4
1,020	67.5
1,513	64.7
2,002	62.6
2,502	60.9
3,002	59.6
5,000	55.6
7,500	52.3
10,560	49.3

DISTANCE TO dB CONTOURS:

Lmax Noise Contour Value (dBA)	Contour Distance (feet)
105	5
100	11
95	21
90	43
85	88
80	177
75	360
70	724
65	1,450
60	2,860
55	5,281
50	10,083
45	37,186
40	64,464
35	91,776
30	119,099
25	125,067

TABLE E-21. MODELED NOISE LEVELS: E-2, APPROACH AT 130 KNOTS

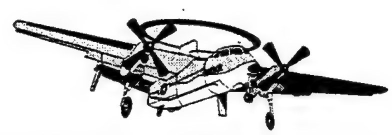
==> Basic sound level drop-off rate:	4.89	dB/doubling
==> Atmospheric absorption coefficient:	0.06	dB/100 meters
==> Reference Level (SEL, Lmax, Leq):	76.36	Lmax dBA
==> Distance for Reference Noise Level:	315	Feet

DISTANCE ATTENUATION:

Receptor Distance (feet)	Lmax Value (dBA) at Receptor
50	89.4
100	84.5
300	76.7
361	75.4
539	72.5
583	72.0
707	70.6
808	69.6
901	68.8
1,020	67.9
1,513	65.1
2,002	63.0
2,502	61.3
3,002	60.0
5,000	56.0
7,500	52.7
10,560	49.7

DISTANCE TO dB CONTOURS:

Lmax Noise Contour Value (dBA)	Contour Distance (feet)
105	6
100	11
95	23
90	46
85	93
80	188
75	381
70	768
65	1,526
60	2,990
55	5,486
50	10,359
45	37,602
40	64,917
35	92,245
30	119,579
25	125,569



Appendix F. Cultural Resources

APPENDIX F
CULTURAL RESOURCES

F.1 PREFERRED ALTERNATIVE: NAWS POINT MUGU

Prehistory

Prehistoric occupation of the region encompassing Point Mugu began at least 3,000 years before present (BP). Two distinct cultural assemblages have been identified for this occupation: the Intermediate Period and the Late Prehistoric Chumash Period. During the Intermediate Period (3,000 to 1,000 years BP), milling activities were common; however, greater emphasis was placed on hunting. Exploitation of marine resources also occurred. Acorns and shellfish were a staple (Grant 1978a,b; Moratto 1984).

The Late Prehistoric Chumash Period (1,000 to 100 years BP) is characterized by a highly developed maritime economy. Subsistence practices focused on hunting marine and land mammals and fishing. Rabbits and squirrels were hunted in greater numbers than in previous times. Shellfish were also exploited, and local plants were consumed. Trade with inland groups also increased during this period and beads took on more of an economical value for exchange, rather than simply an ornamental value as had been the standard (Grant 1978a,b; Moratto 1984).

Ethnohistory

The primary Native American group to occupy the coastal territory encompassing NAWS Point Mugu was the Ventureño Chumash. The Ventureño Chumash territory was mainly mountainous, except for the Oxnard Plain between Ventura and Point Mugu. The northern extent of their territory encompassed the headwaters of the Ventura and Santa Clara rivers (Grant 1978b).

Chumash resided in villages or rancherias comprised of patrilinial descendant groups. Villages were large with populations up to 1,000, although smaller groups dispersed in the spring and summer to locations of available resources. A typical

Chumash village included several houses, a sweathouse, store houses, a ceremonial enclosure, and a cemetery located away from the living area (Grant 1978b).

Subsistence practices utilized both marine and terrestrial food resources. Acorns and piñon nuts were a staple. Other harvested plants included bulbs, berries, chia sage, and seeds. Mule deer, coyote, fox, rabbits, and game birds were hunted. From canoes, seals, sea otters, porpoises, shark, and large fish were harpooned. Smaller fish were captured with seines and dip nets. Mollusks, clams, and abalone were consumed in great numbers (Grant 1978b).

Although the Ventureño Chumash territory was visited by Juan Rodríquez Cabrillo in 1542, the group did not experience any real effects of European presence in the area until the late 1700s. In 1772, the San Luis Obispo Mission became the first Franciscan mission in Chumash territory. It was soon followed by the San Buenaventura, Santa Barbara, La Purísima Concepción, and Santa Ynez missions. By the early 1800s, the majority of the Chumash had been forced onto the missions. The remainder fled into the mountains and inland valleys. Within the missions, Chumash populations rapidly dwindled. Many perished from introduced diseases. Following secularization of the missions in the 1830s, the Chumash were exploited as cheap labor by first Mexican, and later Anglo-American settlers. These events all had a drastic effect on the Chumash population. The entire Chumash population in 1770 has been estimated between 8,000 and 17,000. By 1920, it was estimated at less than 100. In 1972, approximately 40 Chumash of various bands resided on the Zanja de Cota reserve near the Santa Ynez mission. Many more are believed to be scattered throughout southern California, but with little knowledge of their traditional culture (Grant 1978a,b). In 1990, the Santa Ynez Band of Mission Indians had a population of 340 Chumash. The population figures for the Coastal Band and Santa Barbara Band of Chumash Indians are not available (National Native American Cooperative 1996).

History

The Point Mugu area was first encountered by European explorers during the expedition of Juan Rodríquez Cabrillo in 1542. Cabrillo named the area "Mugu" after a Chumash word meaning beach. However, Spanish settlement along the California coast did not occur until the 1770s when Franciscans began to establish missions. The San Buenaventura Mission, established in 1782, was the closest in proximity to Point Mugu, located approximately 15 miles northwest of Mugu Lagoon. The Spanish relocated the native populations to the mission, and introduced wheat as the primary agricultural crop and raised cattle (Swanson 1994).

In 1821, when Mexico obtained independence and control of California from Spain, the large mission holdings were divided and given away as land grants. Two Mexican ranchos, based on these land grants, were established in the Point Mugu area: Rancho El Rio de Santa Clara o La Colonia and Rancho Guadalasca. Although the rancho boundaries were not well defined, Mugu Lagoon appears to

have been near the border of Rancho El Rio while the majority of it was considered part of Rancho Guadalasca, awarded to Ysabel Yorba in 1836. In her petition for the land, Yorba claimed that she intended to raise cattle on the land to support herself (Swanson 1994).

Following the annexation of California into the United States in 1845, existing land claims were challenged and the Mexican rancho system of land ownership was eventually dissolved. Ysabel Yorba sold several parcels of the Rancho Guadalasca between 1870 and her death in 1873. Following her death, the remainder of the rancho was subdivided and sold to American settlers and businessmen. In 1880, William Broome purchased over 22,000 acres of the rancho and kept the original name for the rancho. Starting in 1864, Thomas Scott, vice-president of the Pennsylvania Railroad, began to buy portions of Rancho El Rio de Santa Clara o La Colonia for the purpose of oil speculation. By the late 1860s, Thomas Bard held the entire rancho in trust for Scott along with an additional 200,000 acres of land in Ventura County. As oil ventures failed, Bard sold or leased parcels of the land to American settlers who recognized the value of the land for agricultural pursuits. Other parcels were lost to homesteaders in disputes over the rancho boundaries. In 1871 and 1872, Bard constructed a wharf and laid out a town at Hueneme. The wharf , and later the railroad, aided the development of local agriculture, which in the 1880s was primarily barley, corn, flax, and wheat (Swanson 1994).

In the mid-1890s through the early years of 20th Century, lima beans and sugar beets were the top agricultural product in Ventura County, with the city of Oxnard growing around the American Sugar Beet Company established by the Oxnard brothers on the plain north of Hueneme. However, while much of the land in Ventura County was devoted to agricultural pursuits, Calleguas Creek and Mugu Lagoon were relatively pristine due to the marshy nature of the land. This slowly changed in the 1920s and 1930s as recreational use of the area increased. Recreational development was possible due to the partition by the Broom family of Rancho Guadalasca, which encompassed the lagoon, and the creation of a coastal highway that linked Ventura County beaches with the Los Angeles area. These developments opened Mugu Lagoon to hunting and fishing enthusiasts. Hunting clubs, such as the Point Mugu Game Preserve, the Ventura County Game Preserve, and the Mugu Fish Camp were expanded near the inlet of Mugu Lagoon. Mugu Lagoon was also the backdrop for several films produced by the movie industry during this time (Swanson 1994).

With the outbreak of World War II, the area around Mugu Lagoon served as a training areas for Seabees stationed at the Construction Battalion Center, Port Hueneme. The Navy negotiated leases for the land with local landowners. A military contingent was also stationed at the Mugu Fish Camp, and a military camp was created by the Acorn Assembly and Training Detachment around Mugu Lagoon. The first runway was built north of the lagoon (Swanson 1994).

The establishment of a formal military base at Point Mugu was authorized by Congress in 1946. Funding was approved in 1948 for the Point Mugu Naval Reservation (Swanson 1994). About this time, the mouth of Calleguas Creek was dredged and the spoil was used as fill for military facilities and new runways. Approximately 1,000 acres (405 hectares) of the base's original surface was buried by three to 12 feet (one to four meters) of new soil (Swanson 1994; Schwartz 1991).

NAWS Point Mugu was originally established in the 1940s as a training facility for the Acorn Training Detachment to train personnel in the construction of small air bases on islands in the Pacific. With the end of World War II, naval training activities ceased at Point Mugu and the installation soon became the Naval Air Missile Test Center, with construction of permanent facilities beginning in 1948. In the 1950s, a new national emphasis was placed on ballistic missiles and space-based programs. As a result, several national missile ranges were created including the Navy's Pacific Missile Range at Point Mugu. Test and evaluation of missile systems continued at Point Mugu during the 1960s and 1970s. During the Vietnam conflict, surface-to-surface, surface-to-air, and air-to-surface missiles were tested primarily at Point Mugu, China Lake, White Sands, and Cape Canaveral. Following this, missile testing by the Navy slowed until President Reagan began a dramatic build up of the military in the 1980s in response to events in Iran and Afghanistan. New naval missile systems were tested at the four primary facilities, including Point Mugu, and consisted of the Trident, Harpoon, Tomahawk, and Aegis systems. With the end of the Cold War came another cut in military spending. In 1990, a plan was developed to streamline the Navy's guided missile research, development, and testing operations. Activities at China Lake, White Sands, and Point Mugu were consolidated into a single organization. In 1992, the Naval Air Warfare Center (NAWC) was established with China Lake as the primary site for research and development, and Point Mugu the primary facility for guided missile test and evaluation (Wee and Byrd 1997). The primary mission of Point Mugu today remains the testing and evaluation of guided missiles.

F.2 NAS LEMOORE ALTERNATIVE

Prehistory

NAS Lemoore is located in the San Joaquin Valley. It is generally believed that human occupation of the San Joaquin Valley dates back to at least 10,000 years before present (BP). A minimum of one site in the valley is thought to have been occupied between 40,000 to 200,000 years BP; however, the reliability of the dating techniques used and the validity of the association of human remains with extinct fauna remains found within the site remains highly controversial. The lifeways of any inhabitants of California during the Pleistocene Epoch (pre-10,000 years BP) is largely unknown. A hunting/gathering strategy has been theorized; however, direct evidence of plant use is lacking and there are few documented relationships between tools and extinct faunal remains. No milling-related artifacts

have been found within sites dating to this period. Use of wood, bone, and stone tools is thought to have occurred (Moratto 1984).

Archaeological evidence for occupation of California during the Holocene Epoch (10,000 years BP to present) is stronger. Early Holocene Period (10,000 to 8,000 years BP) sites are common throughout California. Hunter/gatherers were attracted to lacustrine and marshland settings for the varied and abundant resources found there. Milling-related artifacts are lacking during this period but the atlatl and dart are common. Heat-treating of lithic materials for tool manufacture is also evident. Hunting of large and small game occurred, as well as fishing. Limited permanent settlements may have been established near large water sources, but a nomadic lifestyle was more common (Moratto 1984).

Milling of plant materials may have commenced later in the Holocene Epoch. Milling-related artifacts first appear in sites dating to the Early Horizon Period (8,000 to 4,000 years BP), but occur infrequently on these sites. Hunting and gathering continued during this period, especially of large game, but with greater reliance on vegetal foods. Mussels and oysters were also a staple. Greater consumption of shellfish and increased milling activities occurred in the Middle Horizon Period (4,000 to 2,000 years BP). Use of bone artifacts increased and baked-earth steaming ovens were developed. Occupation of permanent or semi-permanent villages and reoccupation of seasonal sites was common in this period. During the Late Horizon Period (2,000 years BP to European Contact), subsistence activities became greatly diversified, exploiting a wide variety of resources. The mixed economy of this period emphasized fishing; hunting waterfowl; and collecting shellfish, roots, and seeds. Settlement of villages also increased, as did trade between different groups (Wallace 1978; Moratto 1984). During this time, regional subcultures developed, each with their own geographical territory and language or dialect.

Ethnohistory

The primary Native American group known to have utilized the southern San Joaquin Valley is the Southern Valley Yokuts. The Southern Valley Yokuts, geographically and linguistically distinguished from the neighboring Northern Valley and Foothill Yokuts, were divided into 15 distinct tribes, each speaking a separate dialect of the Yokuts language and controlling a separate territory of approximately 250 square miles (648 square kilometers). The territory encompassing the present-day NAS Lemoore was occupied by the Tachi tribe. Each Southern Valley Yokuts tribe is estimated to have included approximately 350 people. Some tribes included only a single village, but more often several settlements comprised one tribe. Villages were occupied nearly year-round, with families leaving for a few months to gather seeds and other wild plants in the spring or summer. During these times, dispersed camps were occupied near the shifting resources (Kroeber 1925; Wallace 1978).

Several tribes, including the Tachi, built single-family dwellings as well as long, steep-roofed communal residences that sheltered 10 or more families. Each settlement also had one communal sweathouse (Wallace 1978).

Subsistence practices of the Southern Valley Yokuts emphasized fishing; hunting waterfowl; and collecting shellfish, roots, and seeds. Antelope and elk were hunted from the lake shores. Wild pigeons, rabbits, and squirrels were also consumed. Large quantities of mussels were gathered, and turtles were commonly eaten. Tule roots and seeds were a staple. Although acorns were not readily available in their territory, Tachi members traveled to neighboring territories to trade fish for acorns (Wallace 1978).

The aboriginal population of the Southern Valley Yokuts has been estimated at between 5,250 and 15,700. Although contact with Europeans first occurred in the 1770s, the Southern Valley Yokuts were not drastically affected until settlement of the valley by Americans in the mid-1800s. Many Southern Valley Yokuts eventually settled in the Tule River Reservation, while a separate Tachi settlement was established near Lemoore. In the early 1970s, 100 members of the Tachi tribe lived on the Santa Rosa Reservation near Lemoore, while 325 Yokuts lived on the Tule River Reservation (Wallace 1978).

History

In 1772, Pedro Fages passed through the Southern San Joaquin Valley en route to San Luis Obispo. Four years later, Francisco Garces, a Franciscan friar, visited the area and kept a detailed journal of his journey. Active explorations began in 1802 with the second administration of Governor Jose Arrillaga, who was eager to gain a foothold in the interior. Several expeditions occurred, beginning in 1806. During the period in which California was ruled by Mexico (1822-1846), no rancheros were established within the southern San Joaquin Valley, and Mexican influence on the Southern Yokuts was minimal (Gallegos and Associates 1997b).

Following the annexation of California by the United States in 1845, the San Joaquin Valley was quickly occupied by settlers. The first community was Visalia founded in 1852. The cities of Hanford and Lemoore were founded circa 1877 when the Southern Pacific Railroad was extended westward from the town of Goshen. By 1891, Lemoore was the largest wool shipping point in California (Gallegos and Associates 1997b).

NAS Lemoore was established in 1957 when the US Navy acquired over 18,000 acres (7,290 hectares) of agricultural land for station operations. At that time, existing farm houses and outbuildings were razed (US Navy 1994d). The primary mission at NAS Lemoore includes a rapid response force of jet fighter and ground support aircraft to meet aggressor actions. The base was commissioned in 1961 and began operations during the height of the Cold War (US Navy 1994d).

F.3 NAF EL CENTRO ALTERNATIVE

Prehistory

NAF El Centro is located in the Colorado Desert Region. The prehistory of the Colorado Desert region includes three major periods of occupation: the Paleoindian Period (12,000 to 7,000 years BP), the Archaic Period (7,000 to 1,200 years BP), and the Patayan Period (1,200 years BP to European Contact). An earlier occupation has been suggested, but there is little evidence to support the claim. The Paleoindian Period is commonly known as the San Dieguito Complex. The San Dieguito populations were mobile hunter-gatherers whose seasonal rounds covered large territories. Sites of this period are frequently located on terraces overlooking major washes and extinct lake shores. In subsequent phases within this period, lithic tools become smaller and more sophisticated. Milling-related tools are absent (Moratto 1984; Apple *et al.* 1994).

During the Archaic Period, hunting and gathering continue, but with greater regional specialization. Sites of this period indicate an adaptation to the drier and warmer climate of the Holocene Epoch. Lithic tools and milling-related artifacts are common. The region encompassing NAF El Centro, however, includes a relative lack of sites dating to this period. This has led to debates over the possible abandonment of the area during this time (Moratto 1984; Apple *et al.* 1994).

The Patayan Period is characterized by the appearance of pottery and floodplain agriculture. During this period, small mobile groups occupied seasonal settlements along the Colorado floodplain. This period encompasses the appearance and disappearance of Lake Cahuilla (approximately 1,000 to 350 years BP, respectively). The now extinct lake is thought to have attracted people from the Colorado River who introduced new technology and pottery (Moratto 1984; Apple *et al.* 1994).

Ethnohistory

The region encompassing the present-day NAF El Centro was occupied prehistorically by the Kumeyaay. Kumeyaay territory included the coastal shore from San Diego to Ensenada, Mexico, and east as far as the Chocolate Mountains. Kumeyaay were loosely organized into bands or autonomous tribelets. Each band controlled a portion of land with boundaries identified by natural landmarks. Communal claims were made to all springs and food resources within that land and boundaries were protected against trespassers. Permanent settlements were rare. Instead, campsites were seasonally reoccupied within a band's territory. Occasionally several bands wintered together in one location but dispersed in the spring. Ceremonial structures were also built within villages; however, sweathouses were not common (Luomala 1978).

Subsistence activities include hunting and gathering with several families joining together at a campsite to gather, process, and cache vegetal foods. Seasonal rounds followed ripening plants from the valleys to the mountains. During different

seasons, agave, mesquite, cactus fruits, buds and blossoms, seeds, wild fruit, acorns, and piñon nuts were gathered. Deer, snakes, and birds were hunted, but rodents provided most of the meat in the Kumeyaay diet. Insects and larvae were also consumed. Trade of acorns, agave, mesquite, and gourds for salt, dried seaweed and other greens, and abalone shells was common with the northwestern neighboring Ipai. Limited floodplain agriculture was practiced along riverbanks (Apple *et al* 1994; Luomala 1978).

The Kumeyaay lifestyle began to change with the establishment of the San Diego Mission in 1769. Within a decade, the mission had converted almost 1,500 Kumeyaay and Ipai to Catholicism and introduced agriculture to them as a way of life. Secularization of the missions in the 1830s resulted in Kumeyaays becoming serfs on the large Mexican land grants given to new settlers. Others fled to the mountains and became fugitives. With American control of California, Kumeyaay served as laborers for ranches, mines, and towns. By 1968, 12 reservations had been established exclusively for Kumeyaay and Ipai members. Kumeyaay also resided on several other reservations shared by many groups. Population figures for Kumeyaay in 1770 were estimated at 3,000 but included only mission converts. In 1968, the Kumeyaay population numbered 1,322 (Luomala 1978).

History

In 1774, Captain Juan Bautista led the first expedition from Tubac, Sonora (near Tucson, Arizona), to Alta, California, and established the Anza trade route. In 1781, the Quechan Indians attacked and destroyed Spanish settlements located at the Yuma River crossing on the Colorado River. As a result, the Spanish abandoned this transportation route (Apple *et al.* 1994).

The Anza trail was reestablished during the war between the United States and Mexico. Shortly before the Treaty of Guadalupe-Hidalgo ended the war in 1848, gold was discovered in California. During the next few years, gold rush miners used the trail as an overland route. In 1859, Fort Yuma was established along the Colorado River at the route crossing below the Gila River confluence (Apple *et al.* 1994).

In 1900, investors in the California Development Company formed the Imperial Land Company to survey and develop lands to attract settlers. During the next few years, the Imperial Land Company established townsites for Imperial, Brawley, Calexico, Hever, and Silsbee. The Southern Pacific Railroad constructed a spurline from their transcontinental line at Niland south through the valley to Calexico. Soon after, the Imperial Valley experienced rapid development. In May 1901, the California Development Company opened the first irrigation canal into the valley area. By 1907, the valley had grown to the point that the citizens formed Imperial County from the eastern half of San Diego County (Apple *et al.* 1994). As a result of the construction of Boulder Dam and the All-American Canal which supplied water, Imperial Valley received increasing recognition as a agricultural center in the 1930s and 1940s (Apple *et al.* 1994).

Military facilities that were to become NAF El Centro were constructed near Seeley, California in 1942 and 1943 around the previously existing Civil Aeronautical Administration airfield (Apple *et al.* 1994). The facility served as a Marine Corps Air Station during World War II and was transferred to the Navy after the war. Through the years, NAF El Centro has been designated the Naval Air Facility, the Naval Auxiliary Landing Field, the Naval Air Station, the Naval Aerospace Recovery Facility, and the National Parachute Test Range (US Navy 1988a).

For 35 years NAF El Centro was involved in aeronautical escape system testing, evaluation, and design. The Naval Parachute Experimental Division began operations at NAF El Centro in 1947 and the Joint Parachute Facility was established in 1951. The United States Naval Aerospace Recovery Facility was established in 1964 and was combined with the Naval Air Facility in 1973 to form the National Parachute Test Range. All parachute test activities were transferred in 1979 to the Naval Air Weapons Center, China Lake and these operations ceased at NAF El Centro. Today, the primary function of NAF El Centro is to serve as a support facility for fleet air squadrons performing tactical air training, and to provide additional support to other DOD components (US Navy 1988a).

F.4 STATE HISTORIC PRESERVATION OFFICER CORRESPONDENCE

DEPARTMENT OF THE NAVY
NAVAL AIR WEAPONS STATION
521 9TH STREET
POINT MUGU, CA 93042-5001

IN REPLY REFER TO:

5090
Ser 832200E/A-489
FEB 19 1998

Ms. Cherilyn Widell
State Historic Preservation Officer
Office of Historic Preservation
P.O. Box 942896
Sacramento, CA 94296-0001

Dear Ms. Widell:

The Naval Air Weapons Station (NAWS), Point Mugu is the preferred site for the relocation of the E-2 squadron from the Naval Air Station, Miramar. The proposed move would require modification of several buildings at NAWS and may spur some additional construction in the near future. In order to address these possible impacts to historic properties, the Navy commissioned an historic architectural review of the buildings to be modified (enclosure 1) and an archaeological survey of areas affected by the building modifications as well as the potential new construction sites (enclosure 2).

These studies document that none of the buildings proposed for modification are eligible for inclusion in the National Register of Historic Places and that there are no archaeological resources located in the areas potentially affected by ground disturbance activities.

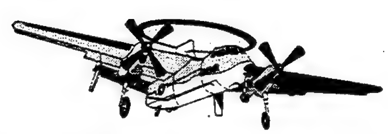
This letter serves as notification under 36 CFR 800.4(d) that there are no National Register properties that may be affected by this proposed federal action. If you have any questions please contact Steven Schwartz, staff archaeologist, at (805) 989-0644.

Sincerely,

Vivian Goo

VIVIAN GOO
Deputy Public Works Officer
By Direction Of The Commanding Officer

Enclosures: 1. Architectural Report
2. Architectural Report



Appendix G. Federal Coastal Consistency Determination

G. FEDERAL COASTAL CONSISTENCY DETERMINATION — G-1

TATE OF CALIFORNIA – THE RESOURCES AGENCY

PETE WILSON, Governor

CALIFORNIA COASTAL COMMISSION

5 FREMONT, SUITE 2000
AN FRANCISCO, CA 94105-2219
OICE AND TDD (415) 904-5200

January 14, 1998

Stephen Beal
Captain, U.S. Navy
Attn: James Danza
Naval Air Weapons Station
521 9th St
Point Mugu, CA 93042-5001

RE: CD-166-97 (Relocation of E-2 aircraft from Naval Air Station Miramar in San Diego County to NAWS Point Mugu, Ventura County)

Dear Mr. Beal:

On January 13, 1998, the California Coastal Commission concurred with the above referenced consistency determination. The Commission found the project to be consistent with the California Coastal Management Program.

Sincerely,

Tania Pollak
Coastal Program Analyst

cc: Ventura Area Office
NOAA Assistant Administrator
Assistant General Counsel for Ocean Services
OCRM
Department of Water Resources
Governor's Washington D.C. Office

DEPARTMENT OF THE NAVY
NAVAL AIR WEAPONS STATION
521 9TH STREET
POINT MUGU, CA 93042-5001

IN REPLY REFER TO:

5090
Ser 83J000E/A-4024

NOV 20 1997

Mr. Peter Douglas
Executive Director
California Coastal Commission
45 Fremont Street, Suite 2000
San Francisco, CA 94105-2219

Dear Mr. Douglas:

This Coastal Consistency Determination (CCD), in compliance with Section 930.35(d) of the National Oceanic and Atmospheric Administration (NOAA) Federal Consistency Regulations (15 CFR 930), is submitted for the potential relocation of four E-2 aircraft squadrons and related support personnel, equipment and functions from Naval Air Station Miramar, to Naval Air Weapons Station (NAWS), Point Mugu.

Most of the facility requirements would be met with existing facilities which would be renovated. However, some facilities will be expanded or constructed. No wetlands or coastal resources will be significantly impacted by this action. Additional project information can be found in the Draft Environmental Impact Statement which is being forwarded to you.

Please keep us informed on the status of your review and the date the Commission will hold a hearing. If you have any questions, our point of contact is Mr. James M. Danza, (805) 989-9747.

Sincerely,

STEPHEN D. BEAL
Captain, U.S. Navy
Commanding Officer

Enclosure: 1. Federal Coastal Consistency Determination

Copy to: Mr. James Johnson
South Coast Central California Coastal Commission Office
Ventura

FEDERAL COASTAL CONSISTENCY DETERMINATION
CALIFORNIA COASTAL MANAGEMENT PROGRAM

Federal Agency:	US Department of Defense, US Navy Point of Contact–Ms. Kelly Knight Naval Facilities Engineering Command, Southwest Division 1220 Pacific Highway, Code 553.KK San Diego, California 92132-5190 Phone–(619) 532-2456
Development Location:	Naval Air Weapons Station (NAWS) Point Mugu Ventura County, California
Development Description:	Relocate four E-2 aircraft squadrons and related support personnel, equipment, and functions from Naval Air Station (NAS) Miramar to NAWS Point Mugu.

Executive Summary:

The proposed action is the realignment of four E-2 squadrons (16 aircraft total) and relocating 988 associated support personnel (130 officers, 818 enlisted personnel, and 40 civilians) and 1,500 family members (710 spouses and 790 children) from NAS Miramar, California to NAWS Point Mugu in Ventura County, California. The base at NAWS Point Mugu is situated along the Pacific Coast. NAWS Point Mugu is on federal property and is not in the Coastal Management Zone. NAS Miramar is also not in the Coastal Management Zone.

To support this action, facilities will need to be constructed, expanded, and renovated at NAWS Point Mugu. Many of the facility requirements could be met through the use of existing facilities. Realignment of the E-2s to NAWS Point Mugu would require relocating several existing tenants and remodeling other buildings on base. A Draft Environmental Impact Statement (EIS) has been prepared in accordance with the National Environmental Policy Act (NEPA) of 1969, as amended, to evaluate the potential environmental impacts that may result from this proposed action and is available for public review.

State Route (SR)-1 provides access to Point Mugu State Park immediately east of NAWS Point Mugu. However, the proposed action would not affect public access to the shoreline. Furthermore, project-generated traffic would result in only a two to six percent increase to existing traffic volumes at key intersections and would not decrease the level of service on any project area street segments. Therefore, existing public access to the shoreline would not be impeded (Secs. 30210, 30211, and 30212).

The proposed action would not interfere with any nearby recreation activities or facilities including those at Point Mugu State Park or the Santa Monica Mountains National Recreation Area (Secs. 30220 and 30221).

There are no significant adverse impacts expected from noise levels produced by the aircraft. These fixed-wing aircraft produce relatively low noise levels at least 10 A-weighted decibel scale (dBA) lower than those produced by fighter jet aircraft, and ambient noise is often relatively high in this area.

Developing 375 new parking spaces could generate oil and grease which could run off to Mugu Lagoon. New construction could also increase erosion. The Navy will undertake all necessary measures, such as fitting parking lot storm drains with structural or non-structural oil and grease traps (i.e., grassy swale detention area), to ensure

that the proposed action does not adversely affect the biological productivity and quality of Mugu Lagoon (Secs. 30230, 30231). NAWS Point Mugu will also follow its Storm Water Pollution Prevention Plan.

The E-2 aircraft squadrons would be required to manage and dispose of hazardous wastes in accordance with existing regulations and basewide protocol regarding storage, use, and disposal. The new aircraft squadrons would not significantly increase the amount of jet fuel transported and stored at NAWS Point Mugu and no new fuel storage facilities would be required (Sec. 30232).

The proposed personnel increase at NAWS Point Mugu could have an indirect effect on coastal resources. However, the Navy will undertake all measures necessary to protect the Lagoon's habitat value and prevent degradation of this and other nearby habitats and recreation areas at Santa Monica Mountains National Recreation Area and Point Mugu State Park (Sec. 30240).

There will be no diking or dredging associated with this project and no filling on wetlands (Sec. 30233). The project is not in an area of known resources potentially eligible for the National Register of Historic Places (NRHP). The State Historic Preservation Officer has been informed of the proposed project. Section 106 consultation would be necessary only if NRHP-eligible prehistoric subsurface deposits are encountered during ground-disturbing activities. Any contract, lease, or permit for ground-disturbing activities at NAWS Point Mugu would include a statement to halt work in the event of a discovery of archaeological materials. In such an event, the Contracting Officer would be notified immediately, and the Base Archaeologist allowed to document and evaluate the resource before work in the discovery area continues (Sec. 30242).

NAWS Point Mugu can accommodate the proposed development (Sec. 30250). New structures would be located in an already-developed area and would be consistent with existing structures in terms of scale and architectural treatments. The new structures would not be visible from outside the base perimeter, and therefore would not degrade the scenic and visual quality of the coastal area (Sec. 30251).

None of the proposed new or expanded sites would be located within the base's flood hazard areas, and erosion control plans would be developed and implemented for any proposed project sites to be graded or left bare during the October-through-April rainy season (Sec. 30253 [1]). With the exception of the proposed vehicle parking lots and the operational trainer facility (OTF), all construction/expansion sites would be on sites already paved or developed and all new or expanded structures would be required to conform with applicable building code regulations. Therefore, stability and structural integrity of new development will be ensured and erosion and geologic instability would be avoided (Sec. 30253 [2]).

Construction contractors will be required to operate their equipment in compliance with applicable air quality control rules. Emission sources under Navy control would result in incremental emission increases that exceed the 25-ton-per-year *de minimis* threshold for ozone precursors in Ventura County and therefore a conformity determination would be required. However, recent reductions in activity levels at NAWS Point Mugu more than compensate for emissions increases associated with the realignment of E-2 aircraft, and thus allow the proposed action to conform with the ozone State Implementation Plan for Ventura County. Projected incremental emission increases for reactive organic compounds and nitrogen oxides are significant for Ventura County's severe ozone nonattainment area. However, compensating emission reductions at NAWS Point Mugu adequately mitigate this impact (Sec. 302533 [3]).

Statement of Consistency:

The US Navy has determined that the proposed E-2 aircraft relocation project at NAWS Point Mugu is "consistent to the maximum extent practicable" with the coastal resources planning and management policies of the California Coastal Management Program.

Signature: ____________________ **Date:** ____________

SECTION 1
PROJECT DESCRIPTION

The proposed action is the realignment of four E-2 squadrons (16 aircraft total) and associated support personnel and their families from Naval Air Station (NAS) Miramar, California to Naval Air Weapons Station (NAWS) Point Mugu in Ventura County, California. To support this action, facilities will need to be constructed, expanded, and renovated at NAWS Point Mugu. Many of the facility requirements will be met through the use of existing facilities. Realignment of the E-2s to NAWS Point Mugu would require relocation of several existing tenants and remodeling of other buildings on base.

NAWS Point Mugu encompasses approximately 4,575 acres (1,851 hectares) of land and marsh area in southern Ventura County. It is located 7 miles (11 kilometers) southeast of the City of Oxnard and 8 miles (13 kilometers) east of the City of Port Hueneme. The base is approximately 5 miles (8 kilometers) from the Los Angeles County line and situated along the Pacific Coast, which forms the southern boundary of the base (Figure 1).

Existing Base Operations

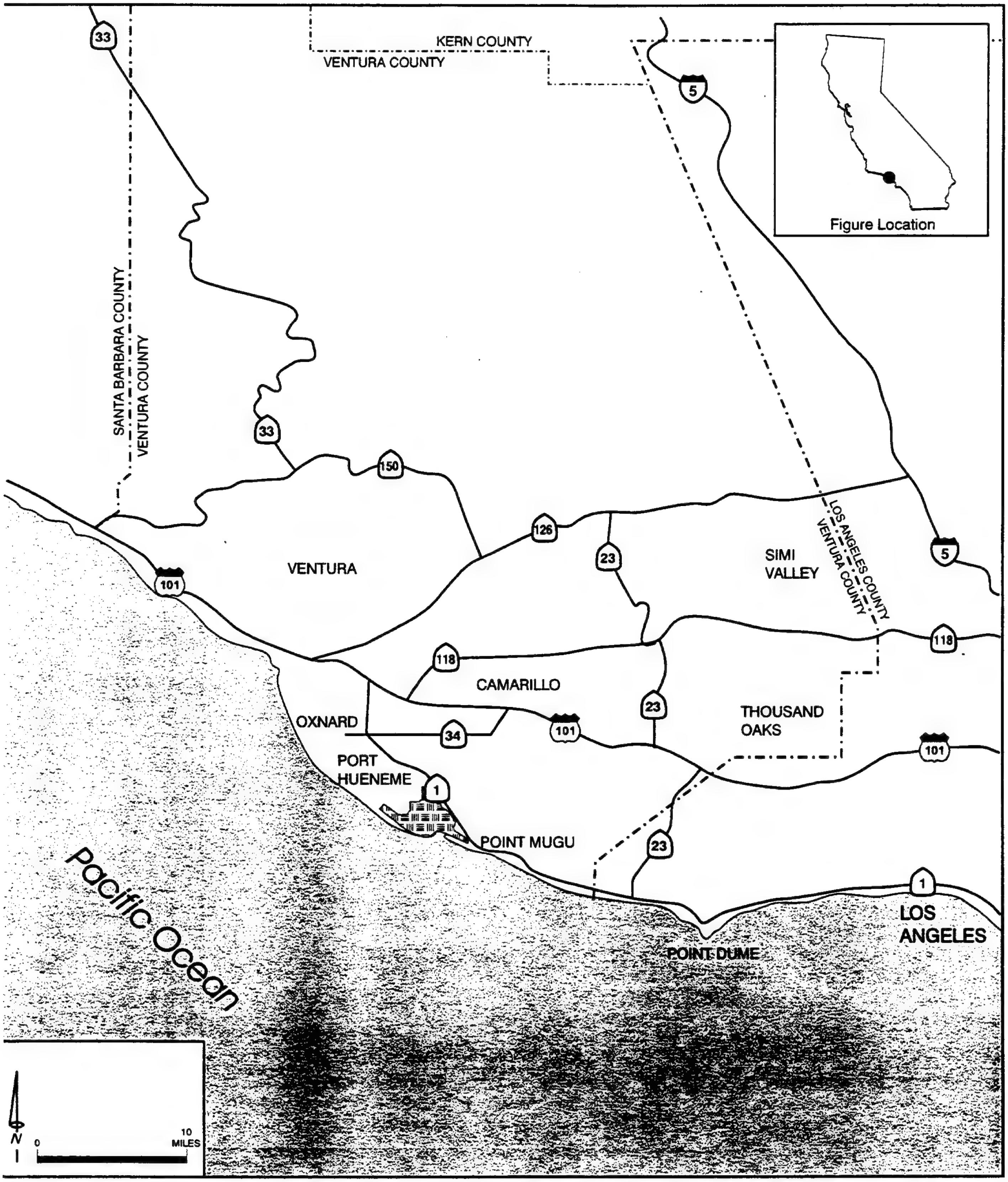
The primary mission at NAWS Point Mugu is the development, testing, engineering support, and training support for naval weapons, weapons systems, and related devices. NAWS Point Mugu manages onshore facilities at the main base, where all proposed E-2 facilities would be constructed.

Proposed Facilities

Tables 1 and 2 provide a summary of the construction and facility modification projects proposed at NAWS Point Mugu. Figures 2 and 3 illustrate the proposed project locations. Proposed facilities are summarized below.

Airfield facilities. An existing 115,000-square-foot (10,683-square-meter) hangar (Building 553) would be expanded by 7,000 square feet (650 square meters) and the interior of the entire hangar would be remodeled to accommodate the squadrons. The rehabilitated hangar would include approximately 650 square feet (60 square meters) for the Special Compartmented Information Facility (SCIF) and 30,346 square feet (2,819 square meters) for the Applied Instruction Building (AIB). The existing aircraft parking apron would be used without modification. The aircraft washrack would be accommodated through expansion of an existing rinserack. Simulated aircraft carrier deck lighting and a landing signal officer station would be added to the runway. This alternative would require the addition of a fixed-point utility system, a fixed-point utility system compressor and two bridge cranes (Table 2). The existing power check pad would accommodate the E-2 squadrons.

Aircraft Intermediate Maintenance Department (AIMD) facilities. Building 385 would be expanded by 7,000 square feet (929 square meters) for the avionics shop. Building 311 would be renovated to accommodate the engine maintenance shop, ground support storage, and ground support maintenance shop. The engine test cell and the aviation supply warehouse could be accommodated through the use of existing facilities.



NAWS Point Mugu is located on the coastline of the Pacific Ocean near Port Hueneme and Oxnard.

LEGEND:

NAWS Point Mugu

Road

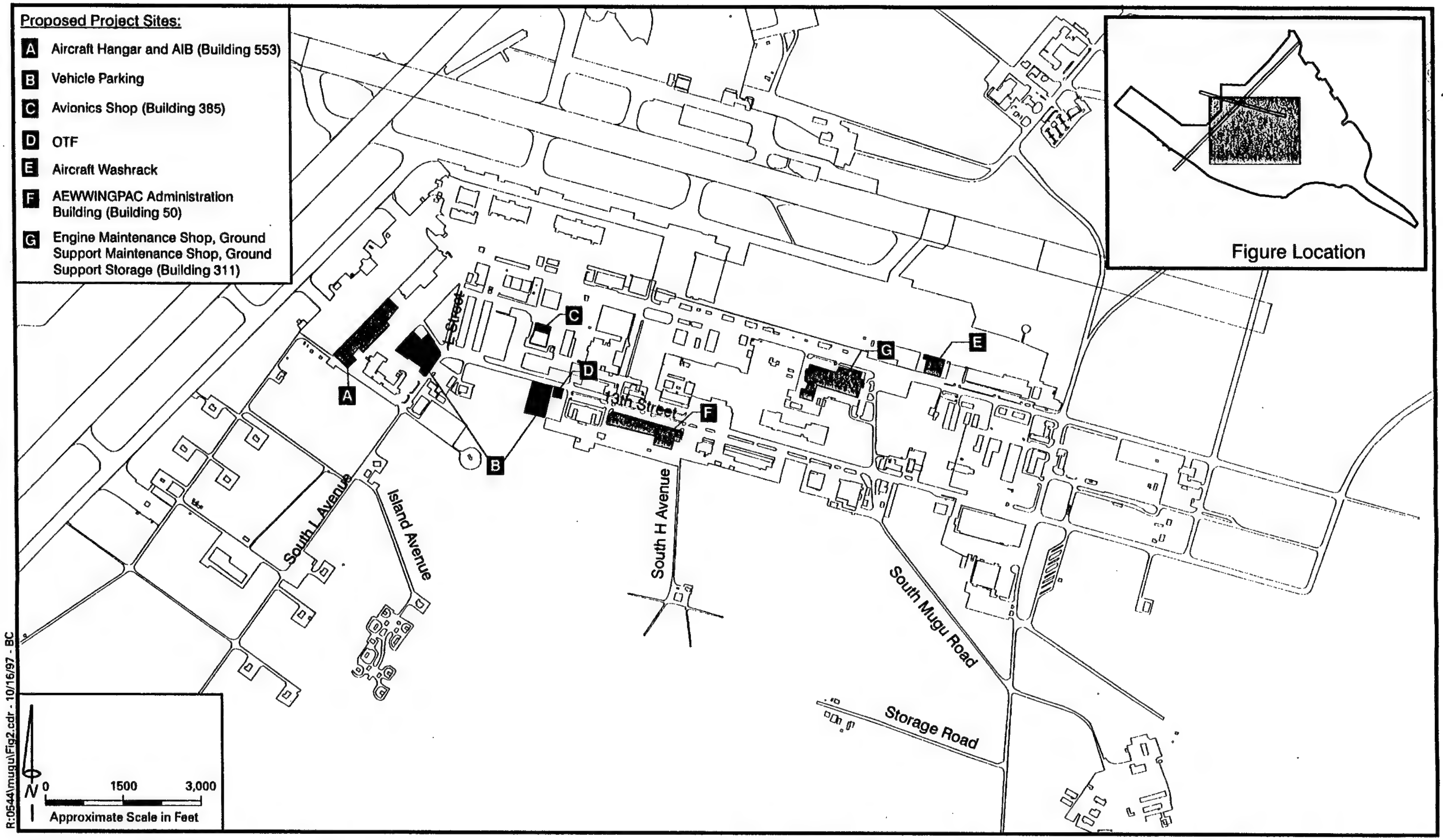
County Boundary

NAWS Point Mugu Regional Location Map

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Source: Creations Graphic Design Company 1997.

Figure 1



With the exception of the proposed vehicle parking lots, all construction/ expansion sites are located on sites that are paved or developed.

LEGEND:

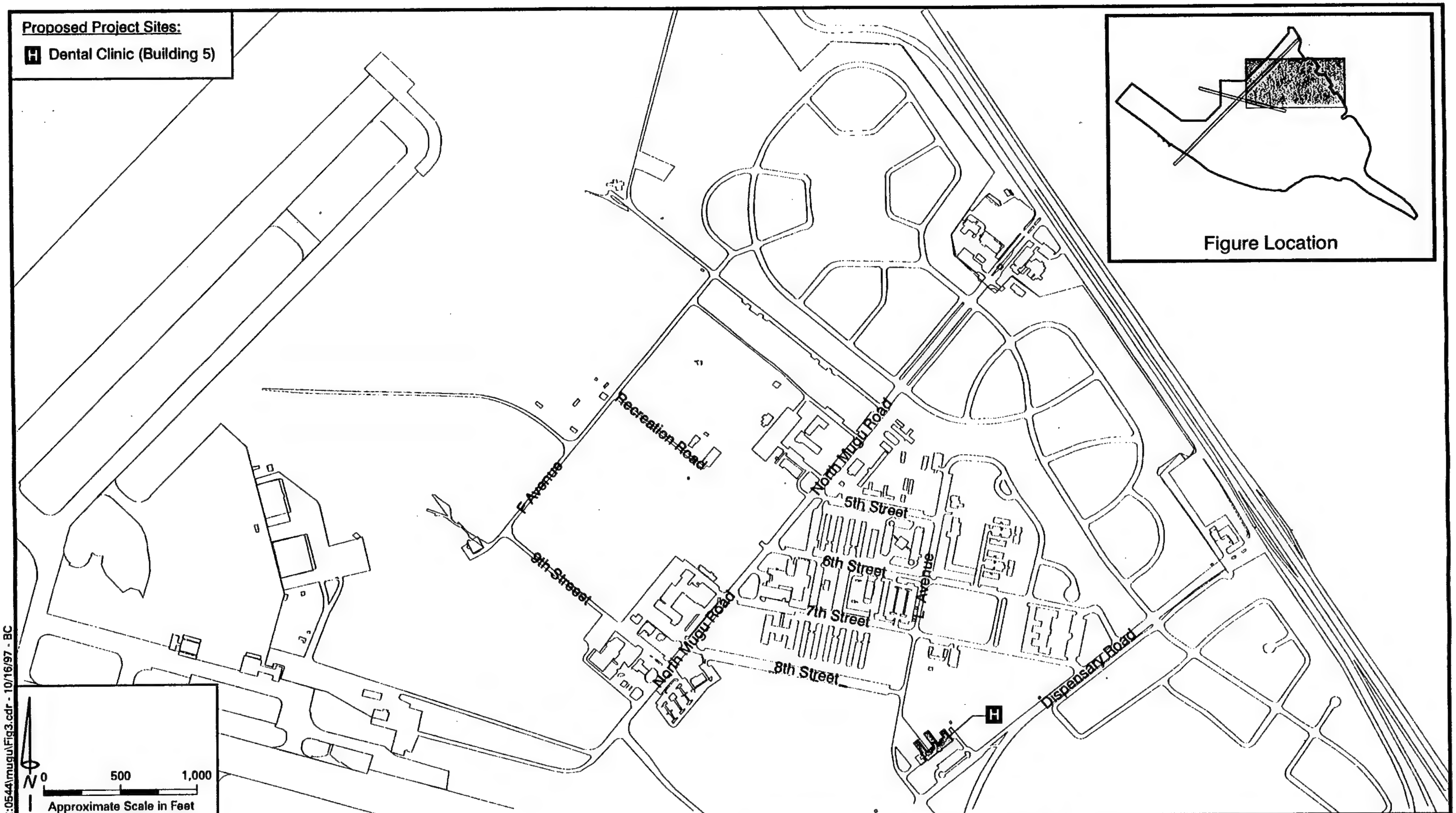
- Construction/Expansion
- Renovation

NAWS Point Mugu Proposed Project Sites: Operations Area

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Figure 2

Source: Hovde 1997.



Implementation of the proposed action at NAWS Point Mugu would require renovation of the dental clinic and family services center.

LEGEND:

Renovation

NAWS Point Mugu Proposed Project Sites: Administration Area

E-2 Aircraft Squadrons Realignment EIS
NAWS Point Mugu, California

Figure 3

Source: Hovde 1997.

Training/administration facilities. A new 9,664-square-foot (898-square-meter) building would be constructed for the Operational Trainer Facility (OTF) and 375 additional parking spaces would be provided. Building 50 would be renovated to accommodate the AEWWINGPAC administration activities. The AIB would be accommodated in the renovated hangar (Building 553).

Personnel support facilities. Internal modifications to the dental clinic (Building 5) would also be needed. Existing BEQ, galley, family services center, child development center, gymnasium, and commissary facilities would have the capacity to accommodate incoming personnel. In addition, some facilities at nearby Naval Construction Battalion Center (NCBC) Port Hueneme are used by NAWS Point Mugu personnel, including a new commissary.

Table 1
E-2 Construction— Expansion Projects at NAWS Point Mugu

Figure Key	Facility	Units[1]	Project Size	Project Type
A	Aircraft Hangar, SCIF, and AIB (Building 553)	SF	7,000	Expansion
A	Aircraft Hangar and AIB (Building 553)	SF	114,652	Modification
B	Vehicle Parking	SP	375[2]	Construction
C	Avionics Shop (Building 385)	SF	7,000	Expansion
D	OTF	SF	9,664	Construction
E	Aircraft Washrack (Existing Rinserack)	SF	30,600	Modification
F	AEWWINGPAC Administrative Building (Building 50)	SF	84,000	Modification
G	Engine Maintenance Shop, Ground Support Storage & Maintenance Shop (Building 311)	SF	91,173	Modification
H	Dental Clinic (Building 5)	SF	3,158	Modification

[1]SF = Square Feet; SP = Spaces
[2]For the NEPA analysis it is assumed that of the proposed 375 spaces, 150 spaces would be located adjacent to the OTF and 225 spaces would be located west of L Street. A study will be conducted to identify exact number and location of needed parking spaces.

Table 2
Other Equipment/Facility Needs at NAWS Point Mugu

Equipment/Facility	Requirement
Bridge Crane	2 cranes
Fixed-point Utility System	1 system with 8 plug-ins
Fixed-point Utility System Compressor	1 compressor

SECTION 2 STATUS OF LOCAL COASTAL PROGRAM

The standard of review for federal consistency determinations is the coastal resources planning and management policies of Chapter 3 of the California Coastal Act of 1976 (California Public Resources Code, Division 20, Sections 30200-30265). Pursuant to the California Coastal Management Plan (CCMP), the federal consistency review authority is not delegated to local governments but remains with the California Coastal Commission. The Coastal Area Plan of the Ventura County General Plan was adopted by the Ventura County Board of Supervisors on November 18, 1980 and certified by the California Coastal Commission on June 18, 1982. This Coastal Area Plan has not been incorporated into the CCMP and therefore cannot be used to guide the commissions' decision, although it can be used as background information.

In the following Determination of Consistency, the applicable California Coastal Act policies are stated first. These state policies are followed by applicable provisions of the Ventura County Coastal Area Plan, which are added as background information. The US Navy then comments on how its proposed development relates to the state policies.

SECTION 3
DETERMINATION OF CONSISTENCY WITH PROVISIONS OF THE CALIFORNIA COASTAL ACT

ARTICLE 2 – PUBLIC ACCESS

STATE POLICIES:

Section 30210. Maximum access, which shall be conspicuously posted, and recreational opportunities shall be provided for all the people consistent with public safety needs and the need to protect public rights, rights of private property owners, and natural resources areas from overuse.

Section 30211. Development shall not interfere with the public's right of access to the sea where acquired through use or legislative authorization, including, but not limited to, the use of dry sand and rocky coastal beaches to the first line of terrestrial vegetation.

Section 30212. (a) Public access from the nearest public roadway to the shoreline and along the coast shall be provided in new development projects except where (1) it is inconsistent with public safety, military security needs, or the protection of fragile coastal resources, (2) adequate access exists nearby, or (3) agriculture would be adversely affected.

COUNTY BACKGROUND:

Most of the coastal recreation areas in the South Coast, including Point Mugu State Park, are accessible from the Pacific Coast Highway (State Route [SR] -1).

US NAVY COMMENTS:

The proposed action would not interfere with the public's right of access to the coast from SR-1. SR-1 provides access to Point Mugu State Park immediately east of NAWS Point Mugu and the proposed action would not affect access to the shoreline. Project-generated traffic would result in only a two to six percent increase to existing traffic volumes at key intersections and would not decrease the level of service on any project area street segments. Therefore, existing public access to the shoreline would not be impeded (Secs. 30210, 30211, and 30212).

ARTICLE 3 - RECREATION

STATE POLICIES:

Section 30220. Coastal areas suited for water-oriented recreational activities that cannot readily be provided at inland water areas shall be protected for such uses.

Section 30221. Oceanfront land suitable for recreational use shall be protected for recreational use and development unless present and foreseeable future demand for public or commercial recreational activities that could be accommodated on the property is already adequately provided for in the area.

COUNTY BACKGROUND:

Recreation on the South Coast is available in several areas. Point Mugu State Park, directly east of NAWS Point Mugu, encompasses over 15,200 acres, with 19,244 feet of beach front, and offers camping, equestrian, bicycling, backpacking, day hiking, picnicking, nature study, and beach use. Recreation activities are also provided at the Santa Monica Mountains National Recreation Area east/northeast of NAWS Point Mugu.

US NAVY COMMENTS:

The proposed action at NAWS Point Mugu would not interfere with any recreation activities or facilities at Point Mugu State Park or the Santa Monica Mountains National Recreation Area. La Jolla Beach, 40 acres of sandy beach and dunes and part of Point Mugu State Park, would also not be affected by the proposed action (Secs. 30220 and 30221). NAWS Point Mugu has recreational facilities accessible to the military, civilians, and their dependents. There will be no affect on offshore recreation, such as increased closures of danger zones.

ARTICLE 4 - MARINE ENVIRONMENT

STATE POLICIES:

Section 30230. Marine resources shall be maintained, enhanced, and, where feasible, restored. Special protection shall be given to areas and species of special biological or economic significance. Uses of the marine environment shall be carried out in a manner that will sustain biological productivity of coastal waters and that will maintain healthy populations of all species of marine organisms adequate for long-term commercial, recreational, scientific, and educational purposes.

Section 30231. The biological productivity and the quality of coastal waters, streams, wetlands, estuaries, and lakes appropriate to maintain optimum populations of marine organisms and for the protection of human health shall be maintained and, where feasible, restored through, among other means, controlling runoff, preventing depletion of ground water supplies and substantial interference with surface waterflow, encouraging wastewater reclamation, maintaining natural vegetation buffer areas that protect riparian habitats, and minimizing alteration of natural streams.

COUNTY BACKGROUND:

Calleguas Creek. The Calleguas Creek watershed includes over 343 square miles of land and empties into the ocean via Mugu Lagoon south of NAWS Point Mugu and north of the Santa Monica Mountains. The floodplain and agricultural lands along the creek are subject to extreme flooding during heavy rains.

Mugu Lagoon. Although completely on federal land and thus not in the Coastal Management Zone, Mugu Lagoon is addressed in the Coastal Area Plan because of its important habitat values, its relationship biologically to intertidal and offshore waters, both state and federal, and its related importance for commercial and sport fisheries.

A number of species found in the Lagoon have been exterminated in other estuaries. The Lagoon serves as a nursery for offshore species. Marine mammals feed and rest in the Lagoon. According to the Coastal Area Plan of the Ventura County General Plan, the endangered light-footed clapper rail, Belding's savannah sparrow, and California least tern use the Lagoon. Other special status species identified by the US Fish and Wildlife Service that may occur in the vicinity of NAWS Point Mugu include the American peregrine falcon, California brown pelican, western snowy plover, salt marsh bird's beak, and Ventura marsh milk-vetch (see Exhibit A).

US NAVY COMMENTS:

Scoping letters for the proposed project, along with a fact sheet, which described the operational components and facility requirements of the project, were sent to the US Fish and Wildlife Service, National Marine Fisheries Service, and California Department of Fish and Game in May 1996. A second letter was sent to the US Fish and Wildlife Service on June 23, 1997 requesting a species list for the proposed action. The US Fish and Wildlife Service provided the US Navy with a list of endangered and threatened species that have been observed in the NAWS Point Mugu vicinity (Exhibit A, Letter, July 29, 1997).

No significant impacts to any marine species are expected. The "touch-and-go" exercises and field carrier landing practices (FCLP's) associated with flight operations would not have any effect on subsurface marine biota. Based on information on the abundance and distribution of marine mammals in the proposed project area, and information on the ranges for the species involved, the proposed action does not pose a significant impact to marine mammals.

There are no impacts expected from noise levels produced by the aircraft. These fixed-wing aircraft produce relatively low noise levels at least 10 A-weighted decibel scale (dBA) lower than those produced by fighter jet aircraft, and ambient noise is often relatively high in this area (the existing 65 decibel [dB] community noise equivalent level [CNEL] contour covers about 8,910 acres [3,609 hectares] at NAWS Point Mugu, including offshore areas, and the immediate airfield vicinity is exposed to CNEL conditions above 75 dB).

No significant impacts to the harbor seal (*Phoca vitulina*) population are expected since noise levels and overflight distance will be within the standard for already-existing operations. The harbor seal population at Point Mugu is habituated to the noise and to the visual presence of the aircraft. They have continued to pup successfully. The air traffic control pattern for fixed-wing approaches is not over the central basin.

No impacts are expected for other inshore or offshore marine mammals. Flight operations would not occur below 500 feet [152 meters] at the offshore zones except possibly during some landings. There would be no long-term or cumulative impact and no effect on the overall population.

Developing 375 new parking spaces could generate oil and grease which, in turn, could be washed into the storm drain system and Mugu Lagoon. In addition, site preparation for new construction could increase erosion. However, the Navy will undertake all necessary measures to ensure that the proposed action does not adversely affect the biological productivity and quality of Mugu Lagoon (Secs. 30230, 30231).

The Navy would be required to comply with the requirements of the Clean Water Act (CWA) that limit non-point-source discharges of pollutants and sediments. New construction would be performed in compliance with the State of California's General Construction Storm Water Permit, and the proposed project sites would be included in the base's Storm Water Pollution Prevention Plan, in compliance with the State's General Industrial Storm Water Permit. Parking lot storm drains would be fitted with oil and grease traps or would drain into sand filters or other structural or nonstructural filters (i.e., grassy swale detention areas). Structural filters or traps would be cleaned as necessary to facilitate optimum effectiveness. Erosion control plans would also be developed and implemented for any proposed project sites to be graded or left bare during the October-through-April rainy season. The Navy would confine E-2 engine cleaning to areas where wash water can be collected and treated. This water would not be directed to storm drains.

STATE POLICIES:

> Section 30232. Protection against the spillage of crude oil, gas petroleum products, or hazardous substances shall be provided in relation to any development or transportation of such materials. Effective containment and cleanup facilities and procedures shall be provided for accidental spills that do occur.

US NAVY COMMENTS:

Realignment of the E-2 squadrons to NAWS Point Mugu would not significantly increase hazardous materials usage or hazardous waste generation. Construction-related activities would require the use of hazardous materials in excess of existing quantities and may generate small amounts of hazardous waste. However, contract specifications control the use of hazardous materials and waste and require compliance with federal, state, and local requirements and with base policy on hazardous materials (Sec. 30232).

The increased amount of hazardous materials due to operations of the E-2 squadrons at NAWS Point Mugu would result in an increased throughput in the Supply Department. However, the US Navy's Environmental Materials Management Division has a facility that will be able to handle the increased hazardous materials throughput. The E-2 aircraft squadrons would be required to manage and dispose of hazardous wastes generated by operations in accordance with existing regulations and basewide protocol regarding storage, use, and disposal. The additional hazardous waste generated by the E-2 aircraft squadrons would result in less than five percent increase in hazardous waste at the base (Sec. 30232).

The addition of the E-2 aircraft squadrons would not significantly increase the amount of jet fuel transported and stored at NAWS Point Mugu, and no new fuel storage facilities would be required. NAWS Point Mugu operates under a basewide program for fuel transportation, storage, and refueling facilities for naval aircraft (Sec. 30232).

STATE POLICIES:

Section 30233. The diking, filling, or dredging of open coastal waters, wetlands, estuaries, and lakes shall be permitted in accordance with other applicable provisions of this division, where there is no feasible less environmentally damaging alternative, and where feasible mitigation measures have been provided to minimize adverse environmental effects.

US NAVY COMMENTS:

There will be no diking or dredging associated with this project and no filling on wetlands (Sec. 30233).

ARTICLE 5 - LAND RESOURCES

STATE POLICIES:

Section 30240(a). Environmentally-sensitive habitat areas shall be protected against any significant disruption of habitat values, and only uses dependent on such resources shall be allowed within such areas.

Section 30240(b). Development in areas adjacent to environmentally-sensitive habitat areas and parks and recreation areas shall be sited and designed to prevent impacts which would significantly degrade such areas, and shall be compatible with the continuance of such habitat areas.

US NAVY COMMENTS:

The proposed personnel increase at NAWS Point Mugu could have an indirect effect on coastal resources. However, as described under Article 4 – Marine Environment, the Navy will undertake all measures necessary to protect the Lagoon's habitat value and prevent degradation of this and other nearby habitats and recreation areas at Santa Monica Mountains National Recreation Area and Point Mugu State Park (Sec. 30240).

STATE POLICIES:

Section 30241. The maximum amount of prime agricultural land shall be maintained in agricultural production to assure the protection of the areas' agricultural economy, and conflicts shall be minimized between agricultural and urban land uses.

Section 30244. Where development would adversely impact archaeological or paleontological resources as identified by the State Historic Preservation Officer, reasonable mitigation measures shall be required.

COUNTY BACKGROUND:

Agriculture on the South Coast extends from the farm lands east of NAWS Point Mugu near Calleguas Creek to the northernmost foothills of the Santa Monica Mountains. Limited agricultural activities occur in the mountains on flatter terrain.

The entire Ventura County coast is archaeologically and culturally significant to a variety of groups. On the South Coast, particularly in the Santa Monica Mountains, archaeological sites are abundant. The County's Public Works Agency reviews all major development applications for archaeological resources. Specific sites, however, are not named to prevent disturbance or destruction.

US NAVY COMMENTS:

Agricultural lands extend west, north, and northeast of the base. However, the proposed action would not result in the conversion of prime agricultural land, nor would it have any affect on agricultural productivity (Sec. 30241).

The project is not in an area of known resources potentially eligible for the National Register of Historic Places (NRHP). The State Historic Preservation Officer has been informed of the proposed project. Section 106 consultation would be necessary only if NRHP-eligible prehistoric subsurface deposits are encountered during ground-disturbing activities (Sec. 30242).

Any contract, lease, or permit for ground-disturbing activities at NAWS Point Mugu would include a requirement to halt work in the event of a discovery of archaeological materials. In such an event, the Contracting Officer would be notified immediately, and the Base Archaeologist allowed to document and evaluate the resource before work in the discovery area continues.

ARTICLE 6 - DEVELOPMENT

STATE POLICIES:

> Section 30250 (a). New residential, commercial, or industrial development, except as otherwise provided in this division, shall be located within, contiguous with, or in close proximity to, existing developed areas able to accommodate it or, where such areas are not able to accommodate it, in other areas with adequate public services and where it will not have significant adverse effects, either individually or cumulatively, on coastal resources. In addition, land divisions, other than leases for agricultural uses, outside existing developed areas shall be permitted only where 50 percent of the usable parcels in the area have been developed and the created parcels would be no smaller than the average size of surrounding parcels.

US NAVY COMMENTS:

The proposed action would occur within a developed base. The services necessary to accommodate the proposed action are available. The existing water, wastewater, and stormwater infrastructure at NAWS Point Mugu has the capacity to accommodate projected increased demand for these utilities as a result of the project. There would be no significant adverse impact on coastal resources. The proposed use of NAWS Point Mugu is compatible with its existing uses (Sec. 30250). The reasoning behind the finding that impacts on coastal resources are not significant is explained in other sections of this Consistency Determination.

> Section 30251. The scenic and visual qualities of coastal areas shall be considered and protected as a resource of public importance. Permitted development shall be sited and designed to protect views to and along the ocean and scenic coastal areas, to minimize the alteration of natural land forms, to be visually compatible with the character of surrounding areas, and, where feasible, to restore and enhance visual quality in visually degraded areas. New development in highly scenic areas such as those designated

in the California Coastline Preservation and Recreation Plan prepared by the Department of Parks and Recreation and by local government shall be subordinate to the character of its setting.

US NAVY COMMENTS:

New structures developed at NAWS Point Mugu would be located in an already-developed area consistent with existing structures in terms of scale and architectural treatments based on the Navy Base Exterior Architecture Plan (BEAP) guidelines and would not be visible from outside the base perimeter. The proposed vehicle parking lot would contrast with the adjacent open space, but would be compatible in character with surrounding nearby developments. Rehabilitating and renovating the aircraft hangar would require internal modifications and expansion of the existing structure, but the hangar is located in an already-developed area and changes would be similar in scale and character to the surrounding area. There would be visible changes from the simulated aircraft carrier deck lighting on the runway and support utilities associated with airfield improvements but these changes would not be visible from off base nor from many of the on base structures. Therefore, the proposed action would not degrade the scenic and visual quality of the coastal area (Sec. 30251).

Section 30253. New development shall:

(1) Minimize risks to life and property in areas of high geologic, flood, and fire hazards.

(2) Assure stability and structural integrity, and neither create nor contribute significantly to erosion, geologic instability, or destruction of the site or surrounding area or in any way require the construction of protective devices that would substantially alter natural landforms along bluffs and cliffs.

(3) Be consistent with requirements imposed by an air pollution control district or the State Air Resources Control Board, as to each particular development.

COUNTY BACKGROUND:

Calleguas Creek is a major flood corridor on the South Coast region that flows along the northern slopes of the Santa Monica Mountains to the Mugu Lagoon. Severe flooding has occurred along the coastal zone portion of this corridor, resulting in damage to adjacent agricultural crops, transportation facilities, and facilities at NAWS Point Mugu.

US NAVY COMMENTS:

Although much of the base is mapped by the US Army Corps of Engineers as subject to 100-year flood hazards, the portion of the base where project improvements are proposed has been protected from flooding by a system of retaining walls and berms. None of the proposed new or expanded sites would be located within the base's flood hazard areas as mapped on the Master Plan Environmental Constraints map. Erosion control plans would be developed and implemented for any proposed project sites to be graded or left bare during the October-through-April rainy season (Sec. 30253 [1]).

With the exception of the proposed vehicle parking lots and the OTF, all construction/expansion sites would be on sites already paved or developed. Furthermore, all new or expanded structures would be required to conform

with applicable building code regulations and erosion control plans would be implemented, as required. Therefore, stability and structural integrity of new development will be ensured and erosion and geologic instability would be avoided (Sec. 30253 [2]).

Temporary construction activity would occur with projects to remodel existing facilities or build new facilities to accommodate the E-2 aircraft, required maintenance and training facilities, and associated personnel. Construction contractors will be required to operate their equipment in compliance with applicable air quality control rules (Sec. 302533 [3]).

Aircraft operations would be the largest source of long-term emissions associated with the realignment action. Emissions associated with base-related vehicle traffic would be the second-largest source of emissions addressed by the US Environmental Protection Agency general conformity rule. Emission sources under Navy control would result in incremental emission increases that exceed the 25-ton-per-year *de minimis* threshold for ozone precursors in Ventura County and therefore a conformity determination would be required. However, recent reductions in activity levels at NAWS Point Mugu more than compensate for emissions increases associated with the realignment of E-2 aircraft, and thus allow the proposed action to conform with the ozone State Implementation Plan for Ventura County (Sec. 302533 [3]).

Ozone precursor emission sources include stationary sources operating under permits issued by the Ventura County Air Pollution Control District (e.g., engine and airframe maintenance facilities) and indirect emission sources that the Navy can not influence or control (household vehicle travel for non-work purposes and natural gas use by off-base households). Modifications to existing maintenance facilities are unlikely to require new air quality permits from the Ventura County Air Pollution Control District unless existing permits contain restrictive limitations on facility use. Modifications to the engine test cell might require minor technical amendments to the existing air quality permit. Some new or replacement equipment (such as standby generators, compressors, etc.) might require new permits from the Ventura County Air Pollution Control District. Projected incremental emission increases for reactive organic compounds and nitrogen oxides are significant for Ventura County's severe ozone nonattainment area. However, compensating emission reductions at NAWS Point Mugu adequately mitigate this impact (Sec. 302533 [3]).